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Louisiana Tertiary Bryozoa.

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LOUISIANA TERTIARY BRYOZOA.

A Dissertation

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in

The School of Geology

By
James H. McGuirt
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Illustrations

Abstract

Material obtained from thirteen exposures of the Claiborne (Eocene), Jackson (Eocene), and Vicksburg (Oligocene) of North Louisiana, and numerous cores of the Heterostegina and Marginulina zones taken from two wells in South Louisiana, furnished 113 species and varieties of bryozoa. Species from cores of the Upper Miocene in a third well are included. The species found are identified, described, and illustrated in this paper. Twenty-seven were recorded in the fossil record as new. The specimens studied represent the orders Cheilostomata and Cyclostomata, and include fifty-five genera. A check list revealed that eleven species were observed in the Claiborne, with eight continuing into the Jackson; seventy-one in the Jackson, with nine ranging into the Vicksburg; thirty-six in the Vicksburg, with two continuing into the Lower Miocene; and fifteen in the Miocene. Besides initially recording the occurrences and ranges of these fossils in the Tertiary of Louisiana, the study shows the fossiliferous deposits of that period to be composed essentially of material laid down in shallow marine waters. Each formation is shown to be distinctive in the faunal assemblage and the numerical abundance of species. The Cook Mountain (Claiborne) with a paucity of species, is, however, rich in the number of specimens of Trochopora, Adeonellopsis, Reptolunulites, and Ellisina. The two Louisiana localities of the Claiborne furnished a fauna that apparently prevailed throughout the Gulf Coast during

that time. The Moodys Branch Marl (Lower Jackson) furnished the largest and most varied fauna. The outcrop at Creole Bluff, Montgomery, Louisiana, correlated with the exposures between Bunker Hill and Stock Landing on the Ouachita River, and with the type Jackson formation at Jackson, Mississippi. A comparison with the previously reported Moodys Branch Marl at the Cocoa postoffice, Choctaw County, Alabama, showed the latter to be higher in the section. The Vicksburg locality (Rosefield, Louisiana) is shown to be probably in the Upper Vicksburg, but strengthens the belief that the members of the Vicksburg group cannot be divided definitely on microfossils. Check lists of bryozoa from available samples of the type Glendon and Marianna (Vicksburg) showed merely an absence of species at Glendon. Eight bryozoa that occurred at Rosefield were described from the Byram-Glendon-Marianna section of Mississippi and Alabama. Nine from the Louisiana locality were described from other Vicksburg stations considered to be older than the Byram Marl (Upper Vicksburg). The age of the Heterostegina zone, Marginulina zone, and the Chickasawhay formations is concluded to be Miocene on the basis of the distribution and ranges of Cupuladria and Discoporella, two genera that have not been observed in any formation considered to be older than the Miocene. Several other species with Miocene-Recent ranges are pictured and described from these horizons.

A brief review of the literature dealing with the formations is given.

Introduction

Several of the shallow water deposits in Louisiana contain excellent bryozoa faunas. This paper introduces to the paleontologist some of these fossils contained in the Miocene, Oligocene and Eocene formations of the Tertiary Period. In addition to identifications and descriptions of species, it is the object of this paper to demonstrate the possibilities of this class of animals for correlation purposes. Canu and Bassler (1920) described hundreds of bryozoa from the early Tertiary[1] deposits of the southeast Gulf Coast States, namely, Mississippi, Alabama, Georgia, and Florida, and the Atlantic Coast states. Material for the later Tertiary (Post-Oligocene) report (Canu and Bassler, 1923) was obtained mainly from the Atlantic Coast region, California and the West Indies. Unfortunately many of the Pre-Miocene bryozoa were described from localities that are the subject of controversies. The vagueness and incompleteness of the locality descriptions offers little opportunity to collect the identical original stratum with any degree of precision.

In addition to the above reports Canu and Bassler's "Fossil and Recent Bryozoa of the Gulf of Mexico Region", "Studies on the Cyclostomatus Bryozoa", and "A Synopsis of Early Tertiary Cheilstome Bryozoa", were indispensable.

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[1] Early Tertiary refers to the Pre-Miocene formations.

These reports comprise the major portion of the literature on the Tertiary bryozoa of North America.

Recent papers by Howe (1933, 1936), Chawner (1936), Howe and Wallace (1932), Moody (1931), Howe and Law (1936), Ellisor (1929), Spooner (1926), Fisk (1938), and many others referred to in these reports, have reviewed in detail the literature on the formations under consideration. The author wishes to avoid adding stratigraphic complications and hence will only point out the obvious correlations and similarities of the byrozoa of certain strata.

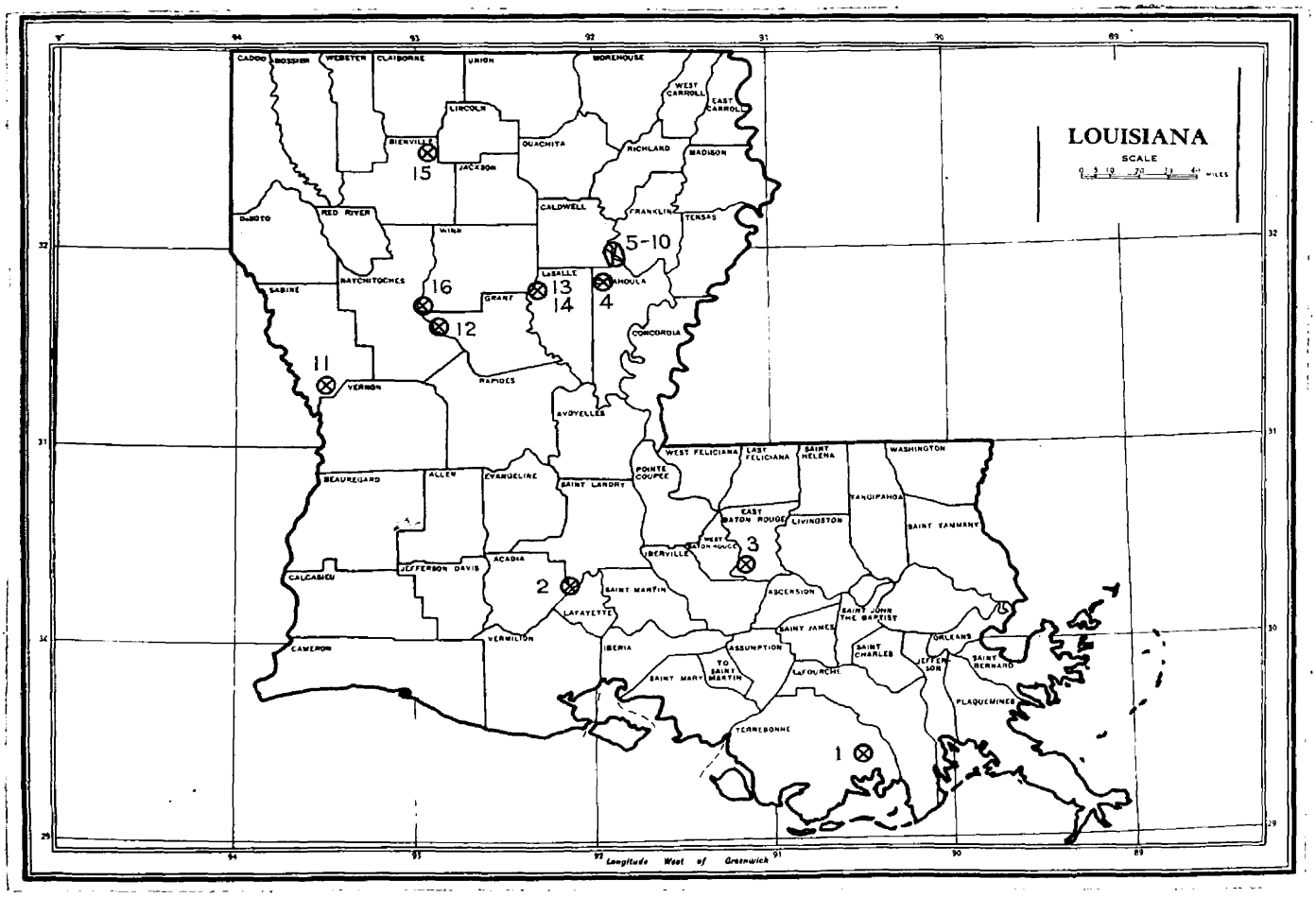

Figure 1. Map of Louisiana showing the distribution of localities.

The present Geological Survey of Louisiana was established in 1934. Time has permitted detailed geology to be extended over only a portion of the state. Needless to say, it is expected that several heretofore unknown localities will be discovered, and that many bryozoa will eventually be added to the present list.

The specimens, as numbered in this report, were secured from the localities by several members of the Geology Department, and are filed in the University Museum Collection.

The distribution of the localities used in this study are shown on the map above (Fig. 1). The numbers correspond to those as listed (pages 32-36).

Ecology

Depth

Bryozoa are usually described in textbooks and reports as representing a condition of clear, shallow to deep water deposition. The Tertiary deposits in Louisiana, in which the remains of these animals are found, are predominantly shallow water sands, silts, and clays. The system is characterized by interfingering continental, brackish, and marine deposits laid down near the constantly fluctuating shore line.

The depths[1] for the genera given below indicate, with few minor exceptions, their occurrence on the continental shelf

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[1] Depths given in fathoms.

well above the outer margin[1].

Thalamoporella - 10

Schizoporella - 0-18

Phylactella - 0-22

Retepora - 10, 27, 683

Cribrilina - 387

Holoporella - 0-143

Hornera - 143

Lichenopora - 2-143

Cupuladria - 30-56

Floridina - 30-56

Mamillopora - 27-56

Puellina - 30-369

Smittina - 0-191

Tubucellaria - 40

Crisia - 0-45

Trypostega - 5-67

Metrarbdotoes -- 21-56

Acanthodesia - 27-30

Nellia - 10-30

Hippomenella - 30

Entalophora - 0-56

Plagioecia - 56

Callopora - 32-201

Cupuladria - 2-56

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[1] Taken from Canu, F., and Bassler, R. S., Proc. U. S. Nat. Mus., Vol. 72, Art. 14, 1928.

The depths substantiate the lithologic characteristics and stratigraphic relationships of the greensands, marls, coquinas, sands and silts prevailing in the Claiborne, Jackson, Oligocene and Miocene beds of the Mississippi embayment.

Eocene Epoch

Claiborne Group

For the marine beds below the Cookfield formation and above the Sparta sand, the name Cook Mountain has been applied since they were so named by Kennedy (1892). Harris (1910) used St. Maurice for the Claiborne below the Cookfield, whereas Spooner (1926) and others have used St. Maurice as more or less synonymous with the original usage of Cook Mountain.

Ellisor (1929) subdivided the Cook Mountain in Louisiana into the Saline Bayou, Milams, and Crockett members. The present writer has used the term Saline Bayou for the beds outcropping at St. Maurice, and feels that this name should be retained for the upper Cook Mountain if the subdivisions are distinct lithologically.

Eleven bryozoa were found in the sands and clays at St. Maurice, Winn Parish, and 2.6 miles southeast of Arcadia, Bienville Parish. Eight of these were observed in beds of the Jackson group, and three were restricted to the Claiborne. Although poor in species, the Cook Mountain contains numerous specimens of the genera Trochopora, Adeonellopsis, Reptolunulites, and Ellisina.

The Claiborne can be differentiated from the Jackson on the basis of these species, as well as on the fauna with the consistent absence of a great variety. It is evident that the Tertiary bryozoa did not become of importance in the Gulf Coast until the beginning of Jackson times. Canu and Bassler (1920) obtained sixty-six species from six Midway localities, and thirty from five Claiborne localities.

Jackson Group

The Jackson group is the most fossiliferous exposed in Louisiana. Since the beds were first noted by Darby (1816) the Jackson has been discussed in numerous papers. The earlier ones were by Vaughan (1895), Harris and Veatch (1899), Harris (1902), and Veatch (1902, 1906A, 1906B). Those who intend to investigate the formation in Louisiana should consult the following more recent papers: Shearer (1930), Howe (1933), Howe and Wallace (1932), Chawner (1936), and Fisk (1938).

In the present report the following zonation for the Jackson is used:

	Danville Landing Beds
Jackson Group	Yazoo Clay
	Moody's Branch Marl

Fisk (1938) states that detailed field work has proven the Danville Landing Beds to be equivalent to the Massilina Beds; the Yazoo clay to Textularia hockleyensis in its entirety,

and Textularia dibollensis in its lower half; Moody's Branch Marl to Textularia dibollensis throughout, and to the Camerina-Operculina zone in its lower 5-10 feet.

In the upper Danville Landing Beds a great number of bryozoa were found, but the species were restricted to six. None of these is confined to the upper beds.

The other Jackson localities examined were from the Moody's Branch Marl, and offered the most distinctive and varied fauna yet observed. Seventy-one species were observed in this thin, but well developed zone. Of this number fifty-three are confined to these fifteen to twenty-five feet of glauconitic marls.

The four and three-tenths miles of lower Jackson (Moody's Branch Marl), exposed on the Ouachita River, from Bunker Hill to Stock Landing, represents a condition of deposition that is nearly identical to that at the Tullos and Montgomery localities. The Danville Landing Beds have a fauna that implies a condition of greater sedimentation and less wave action in a zone just beyond the strand line.

It is interesting to note that thirty-two of the species occurring in the Jackson of Louisiana were found by Canu and Bassler at Jackson, Mississippi. It becomes evident, also, that the United States Geological Survey localities from Shubuta, Mississippi, and Cocoa postoffice, Choctaw County, Alabama, are not the Moody's Branch Marl of the Louisiana section, but occupy positions higher in the Jackson

group[1].

Oligocene Epoch

Vicksburg Group

Since the description of the deposits exposed at Vicksburg, Mississippi, by Conrad (1846), many paleontologic and stratigraphic papers have appeared on the Vicksburg group. For the most detailed and complete study of the type section the reader should consult Mornhinveg and Garrett (1935). They revised the group as divided by Cooke (1918, 1932), and appeared with the following subdivisions for the vicinity of Vicksburg:

Catahoula[2] - Light grey to brown, laminated, argillaceous friable sandstone.

Byram - Grey to green, glauconitic, very fossiliferous marl, (50-55 feet).

Glendon ? - Hard, gray limestone with thin beds of gray, fossiliferous marl, (20-25 feet).

Marianna ? - Cream to white limestone with thin beds of chalky marl and sandy clay. (15-20 feet).

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[1] For discussion on the Jackson of eastern Mississippi, see: Monsour, Emil, "Micro-Paleontologic Analysis of Jackson Eocene of Eastern Mississippi", Amer. Assoc. Petrol. Geol., Vol. 21, No. 1, Jan. 1937, pp. 80-96.

[2] The present writer considers the Catahoula to be Miocene.

Mint Spring - Lignitic sands and clays, sparingly fossiliferous, (20-25 feet).

In Louisiana, at least a portion of the above section is exposed. From samples collected in the railroad cut at Rosefield, Catahoula Parish, thirty-six species of bryozoa are described and pictured by the present writer. The fauna is distinctly different from that of the underlying Jackson, and that of the Miocene found in wells in the southern part of the state. Twenty-five of these species are restricted to the beds at Rosefield.

Howe, in the "Review of Tertiary Stratigraphy of Louisiana", refers the highest fossiliferous beds at Rosefield to the Byram. No correlation is made by Howe and Law (1936) in their "Louisiana Vicksburg Oligocene Ostracoda". Later, Chawner (1936) refers the upper cut at Rosefield to the Byram, and the lower to the Byram ?-Glendon ?. By comparing the bryozoa from near the base of the Rosefield cut with those reported by Canu and Bassler at Byram, Mississippi (Byram Marl); Vicksburg, Mississippi (Byram Marl; Marianna limestone); 1 mile north of Monroeville, Alabama (Marianna limestone); and McGowans Bridge, West bank Conecuh River, one mile below mouth of Sepulga River, Escambia County, Alabama (Glendon limestone), the present writer found that one of the bryozoa was restricted to the Byram marl, seven occur in the combined Byram marl and Glendon-Marianna section, and nine others were described from the beds in the Vicksburg group below the Byram.

From material collected at the type Marianna limestone

(Marianna, Florida), and type Glendon (Glendon, Alabama), by H. V. Howe, the following bryozoa were noted:

Marianna	Glendon
Reptolunulites verrucosa	Idmonea triforata
Steganoporella vicksburgica	Reptolunulites verrucosa
Stomachetosella crassicollis?	Stamenocella inferaviculifera
Stamenocella inferaviculifera	Membraniporidra spissimuralis
Puellina radiata	Floridana sp. (Floridina)
Trigonopora moniliferum	Nellia occulata
Tubucellaria vicksburgica	Tubucellaria vicksburgica
Enoplostomella vallata	Entalophora proboscidea
Holoporella sp.	Entalophora sp.
Adeonellopsis cyclops	
Membraniporidra spissimuralis	
Floridana cf. antiqua	
Crisia hornesi	
Entalophora proboscidea	
Entalophora semota	
Exochoecia rugosa	
Idmonea triforata	
Oncousoecia quinqueseriata	
Nellia occulata	

Other than an absence of certain species at Glendon, the two type localities furnished identical bryozoa. Six of these occur at Rosefield, Louisiana, and four at Byram, Mississippi.

It is apparent that the beds occurring in the lower cut

at Rosefield cannot be correlated with any definite member of the Vicksburg group. However, the general appearance of the assemblage is more closely related to the upper Vicksburg section.

Miocene Epoch

Discorbis, Heterostegina, Marginulina zones.

The Discorbis, Heterostegina, and Marginulina zones were defined by Applin, Ellisor and Kniker (1925) and assigned as follows: "The presence of Heterostegina antilla, Cushman, in the Marine Oligocene beds of Texas, correlates these beds with the Antigua formation of the West Indies, the type locality of the Middle Oligocene,.....". Subsequently, one of the greatest controversies in the Gulf Coast has arisen over these and associated beds.

Howe (1933) suggested that the Heterostegina zone and perhaps also the Discorbis and Marginulina zones should be correlated with the Chattahoochee formation, or Tampa limestone, as the seaward equivalent of the Catahoula. Additional information was furnished by the Shreveport Geological Society in 1934, when the Upper Chickasawhay, Lower Chickasawhay, and Bucatunna members of the Catahoula were described from Wayne County, Mississippi. McGuirt[1] at that time considered the Chickasawhay members to be Miocene on the basis of bryozoa

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[1] In a paper included in the Shreveport Geological Society Eleventh Annual Field Trip Guidebook.

submitted to him. A year later Cooke (1935) placed these beds in the Vicksburg group. He states: "The Guidebook includes a report by Hanna and Gravell on cores and cuttings from a well drilled somewhere in South Mississippi in which the Chickasawhay Marl member of the Byram, recognized by the presence of Lepidocyclina, is overlain by 200 feet of sand and clay, which underlies about 150 feet of chalk and sandy limestone containing Sorites." Cooke concludes that since the Sorites occurs in the Chipola formation and Tampa limestone of Florida the upper 150 feet of chalk and sandy limestone represent the Tampa and perhaps the Chipola, and that the underlying sand and clay (with the Heterostegina) represent the Catahoula and is probably Oligocene.

The Lepidocyclina texana horizon, a subdivision of the Heterostegina zone, was recently established by Gravell and Hanna (1937), and assigned to the Upper Oligocene partly on the basis of Lepidocyclina (Nephrolepidina) apparently L. (N.) undosa Cushman, and Lepidocyclina (Eulepidina), apparently L. (E.) favosa Cushman. From several wells Gravell and Hanna noted the Lepidocyclina texana horizon occurs approximately 200 feet below the first Heterostegina.

In south Louisiana, fifteen bryozoa were secured from the Heterostegina and Marginulina zones in cores from the Superior Oil Producing Company's Duplantier No. 1 well, Sec. 65, T. 7S., R. 1W., East Baton Rouge Parish, at depths of 7671-8101 feet, and from the Superior Oil Producing Company's Hernandez No. 1 well, Sec. 24, T. 8S., R. 3E., Acadia Parish,

7950-8543 feet. Only two of these species have been observed in deposits older than the Miocene, and one of those ranges from the Eocene into the Recent. Further, two genera, Cupuladria and Discoporella, that were secured from cores 173 feet above and 231 feet below the Lepidocyclina texana zone of Gravell and Hanna in the Duplantier No. 1 well, have very wide distributions and range from the Miocene to the Recent. Cupuladria and Discoporella have been observed by the author or listed by Canu and Bassler from the following formations:

> Caloosahatchie, Chootowhatchee, Shoal River, Oak Grove, Chipola and Tampa of Florida; Waccomaw and Duplin Marl of South Carolina and North Carolina; St. Marys of Maryland; Yorktown of Virginia; Sicilian, Astian, Plaisancian, Tortonian, Helvetian, Burdigalian, and the Aquitanian of Europe.

The age of the Aquitanian has been recently questioned by writers on the Gulf Coast area. Vaughan (1924) states: "If the American strata correlated with the European Aquitanian are really of Aquitanian age, they will have to be referred to the Miocene." Woodring (1928) in his correlation of Miocene deposits of tropical America places the Aquitanian in the Lower Miocene. Finally, Davies (1934) states: "The Miocene of Florida, the Molluscan fauna of which has lately been monographed by Dr. Julia Gardner, forms a very complete sequence. The Tampa 'Silex' and Chattahoochee formations at the base are generally recognized as Aquitanian; the Chipola marls are checked by the mammal Merychippus as Burdigalian

or lower Vindobonian; the Oak Grove sand and Shoal River formations are Vindobonian (these with the Chipola forming the Alum Bluff series), while the Choctawhatchee Marl is Upper Miocene." In this and other instances the unquestioned age of the Aquitanian is pointed out.

From the above discussion, and the fact that the original correlation of the Heterostegina zone with the Antiqua was based on a species that, according to Gravell and Hanna, does not occur in the Heterostegina zone, the author is convinced of the Miocene age of the Discorbis, Heterostegina and Marginulina zones, and the Chickasawhay formations.

Locality Number	Miocene 1	Miocene 2	Oligocene (Vicksburg) 3	Eocene (Jackson) 4	5	6	7	8	9	10	11	12	13	14	Claiborne (Cook Mountain) 15	16	Generic Ranges*	Specific Ranges*
Name of Species																		
Dakaria sp.		X															E-R	M
Retepora doverensis		X															E-R	M
Cupuladria canariensis	X	X															M-R	M-R
Tubucellaria sp. A		X															E-R	M
Tubucellaria sp. B		X																M
Discoporella umbellata	X	X															M-R	M-R
Cribrilina miocenica		X															E-R	M
Porella compacta		X															E-R	O-M
Trigonopora sp.		X																
Stamenocella howei,		X															C-M	M
Trigonopora colligatum var. catahoulana..		X															E-R	M
Thalamoporella biperforata	X	X															O-R	M

Locality Number	1	2 3	4	5	6	7	8	9	10	11	12	13	14	15	16	Generic Ranges	Specific Ranges
Name of Species																	
Mamillopora tuberosa		X														E-R	M
Discoporella doma	X	X															M-R
Trigonopora sp.		X															
Nellia occulata	X	X								X		X				E-R	
Crisulipora sp.		X														O-R	
Crisulipora cf. C. prominens.....		X															
Entalophora semota		X														J-R	V
Trigonopora grande		X															V
Holoporella cf. H. discus		X														E-R	V
Plagioecia discoidea		X														J-R	V
Conopeum sp.		X														C-R	
Enoplostomella magniporosa		X														E-R	V
Enoplostomella russelli		X															V
Kleidionella sp.		X														C-O	
Membraniporina tubulosa			X													C-R	V
Membraniporidra spissimuralis			X													C-R	Ja-V
Adeonellopsis cyclops			X													E-R	V

Locality Number	1	2 3	4	5	6	7	8	9	10	11	12	13	14	15	16	Generic Ranges	Specific Ranges
Name of Species																	
Puellina rosefieldensis			X													T-R	V
Puellina radiata var. carolinensis.....			X														Ja-V
Kleidionella grandis			X														Ja-V
Reptolunulites tintinabula			X													C-R	V
Perigastrella sp.			X													C-R	
Smittina sp.			X													E-R	
Smittina rosefieldensis			X														V
Metrocrypta rosefieldensis			X													E-O	V
Nellia sp.			X														
Reptolunulites vicksburgensis			X														V
Adeonellopsis grandis			X														V
Thalamoporella sp.			X														
Holoporella rosefieldensis			X														V
Entalophora cylindrica			X										X				Ja-V
Adeonellopsis cf. A. galeata			X		X												V
Stamenocella inferaviculifera			X		X	X	X		X	X	X		X				Ja-V
Reptolunulites ligulata			X				X	X	X	X	X		X				Cl-Ja

Locality Number	1	2 3	4	5	6	7	8	9	10	11	12	13	14	15	16	Generic Ranges	Specific Ranges
Name of Species																	
Reptolunulites fenestrata								X			X						Ja
Crisia hornesi			X				X						X			E-R	
Pleuronea fenestrata			X		X		X		X		X	X	X			E-P	Cl-V
Otionella tuberosa				X	X	X	X	X	X	X	X					C-E	Cl-Ja
Schizorthosecos danvillensis				X			X				X		X			E	Ja
Adeonellopsis transverse				X	X	X	X				X	X	X	X	X		Cl-Ja
Acanthionella oecioporosa				X	X			X	X		X	X		X	X	C-E	Cl-Ja
Schizorthosecos interstitia				X	X	X	X	X	X		X	X	X	X	X		Cl-Ja
Vibracellina montgomeryensis											X			X		E-R	Ja
Conopeum wilcoxianicum var. ouachitaensis					X												Ja
Porella ouachitaensis					X												
Hippomenella incondita					X											E-R	Ja
Hippomenella transversora					X												Ja
Conopeum lamellosum					X						X	X	X				Ja
Gigantopora grandviewensis						X										C-R	Ja
Lichenopora grigonensis							X				X					C-R	Mid-Ja
Adeonellopsis sp. A											X						

Locality Number	1	2 3	4	5	6	7	8	9	10	11	12	13	14	15	16	Generic Ranges	Specific Ranges
Name of Species																	
Adeonellopsis sp. B											X						
Holoporella granulosa					X	X	X		X		X			X	X		Cl-Ja
Erkosonea semota							X						X			E	Ja
Hippomenella rotula							X				X		X				Ja
Bactridium heisonensis					X	X	X		X		X					E-M	Ja
Porella denticulifera					X		X		X		X	X	X				Cl-Ja
Stamenocella anetina							X										Ja
Porella jacksonica											X		X				Ja
Schizorthoecos grandiporosum							X				X		X		X		Cl-Ja
Ochetosella jacksonica					X		X		X		X		X			E	Cl-Ja
Trypostega venusta			X	X				X			X	X				E-R	Ja-V
Trochopora bouei					X	X	X	X			X		X		X	E-M	Cl-Ja
Otionella perforata					X	X	X	X			X		X	X	X		Cl-Ja
Reptolunulites jacksonensis					X		X	X	X		X		X				Ja
Schizoporella sp.									X							E-R	
Stamenocella mediaviculifera									X								Ja
Phylactella parvicellum									X							E-R	Ja

Locality Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Generic Ranges	Specific Ranges
Name of Species																		
Callopora montgomeryensis										X		X					C-R	Ja
Conopeum sp.										X								
Heteropora ovalis												X					C-R	Ja
Conopeum hoockeri												X						Ja
Amphiblestrum rectum												X					C-R	Ja
Porella coronata var. moodysbranchensis..												X						Ja
Perigastrella elegans												X						Ja
Perigastrella oscitans												X						Ja
Amphiblestrum chawneri												X						Ja
Onychocella celsa var. montgomeryensis ..												X					C-R	Ja
Ochetosella canui												X						Ja
Smittina angulata												X		X			E-R	Cl-Ja
Reptolunulites bassleri var.montgomeryensis												X						Ja
Reptolunulites bassleri												X						Ja
Trochopora truncata												X						Cl-Ja
Porella montgomeryensis												X						Ja
Holoporella fissurata												X						Ja-V

Locality Number	1	2 3	4	5	6	7	8	9	10	11	12	13	14	15	16	Generic Ranges	Specific Ranges
Name of Species																	
Holoporella sp. A											X						
Micropora ? sp.											X					C-R	
Hippomenella fiski											X						Ja
Holoporella montgomeryensis											X						Ja
Osthimosia glomerata											X					E-R	Ja-V
Callopora filoparietis var. montgomeryensis											X						
Hippomenella sp.											X						
Acanthodesia sp.											X					E-R	
Hornera jacksonica												X	X			E-R	Ja
Metradolium sp.													X			E	
Hippomenella radicata													X				Ja
Floridinella sp.													X			C-R	
Crisulipora sp. (Entalophora sp.)													X				
Reptolunulites grandipora var. claibornensis														X	X		Cl
Ellisina claibornensis															X	C-R	Cl
Selenaria auricularia															X	E-R	Cl

SYMBOLS*

C - Cretaceous

Cl - Claiborne

E - Eocene

J - Jurassic

Ja - Jackson

M - Miocene

Mid - Midway

O - Oligocene

P - Pliocene

R - Recent

T - Tertiary

V - Vicksburg

List of Localities

1. Terrebonne Gas Company, Fee No. 1 well, Terrebonne Parish, 2300 feet, (Pliocene ?-Miocene ?).
2. Superior Oil Producing Company, C. B. Hernandez No. 1 well, Sec. 24, T. 8S., R. 3E., Acadia Parish, 7950-8543 feet. (Lower Miocene).
3. Superior Oil Producing Company, Duplantier Community No. 1 well, Sec. 65, T. 7S., R. 1W., East Baton Rouge Parish, 7671-8101 feet. (Lower Miocene).
4. Rosefield, Catahoula Parish.

A detailed section of a recent cut was made by H. N. Fisk at the request of the author. The section is as given below.

Elevations:

287 feet - Top of cut.

279 feet - Badly weathered, leached, sandy light colored clays.

277 feet - Badly weathered, leached, sandy light clays containing casts of Pecten and other shells.

276 feet - Lignite layer (1½ feet).

274½ feet - Badly oxidized greensand layer with lime concretions.

274 feet - Very fossiliferous layer 2 inches thick directly below the above, and intermixed with greensand.

273 feet - Greensand layer ½ inch thick, inter-

bedded with silty clays.

272 feet - Brown sand layers interbedded with light colored fossiliferous clays.

271 feet - Sandy layer, 2 inches thick with abundant fossils, interbedded with fossiliferous clays.

268 feet - Small layer of fossils in sandy clay lense.

266 feet - Fossiliferous sandy clay.

265 feet - Coquina layer, 1½-2 feet.

264 feet - Fossiliferous sandy marl with large sand concretions.

262 feet - Friable, fossiliferous, sandy marl, approximately 3 feet thick extending to base of cut.

Samples collected from 262 and 264 feet contained the bryozoa discussed in this report.

Collections from this section were also made by W. D. Chawner and H. V. Howe.

5. Danville Landing, Catahoula Parish.

The following section at Danville Landing is taken from W. D. Chawner (1936).

Elevation in feet

170 Thin-bedded, grey, clay shales and sands, nonfossiliferous. (Vicksburg).

170-140 Covered with grey, sandy gumbo subsoil, occasional outcrops of brown clay.

(Vicksburg).

140-130 Fossiliferous, grey clay with thin limestone and buff marl lenses, badly leached and probably somewhat slumped. There is little if any original shell substance left to the fossils. Prominent are impressions of a small Corbula sp. and a small Venericardia (?). (Jackson?).

130-125 Fossiliferous, blue-grey clay, possibly slump. (Jackson, Danville horizon).

125-70 Partially covered and slumped section of yellowish brown, calcareous and fossiliferous clay. (Jackson).

70-50 Yellow-brown, calcareous, fossiliferous, sticky clay with large selenite crystals, and lenses of buff limestone. Contains a good macro- and micro-fauna. (Upper Danville of Howe and Wallace, 1933).

50-25 Fossiliferous, greenish-grey clay and blue-grey clay with shell lenses. (Lower Danville of Howe and Wallace, 1933).

The bryozoa described from this locality came chiefly from the Upper Danville Landing horizon (70-50 feet). The material was collected by H. V. Howe and H. N. Fisk.

6. Bunker Hill, Caldwell Parish.

From W. D. Chawner (1936):

A 25-foot section, complicated by slumping, is

exposed here. The base of the Jackson occurs at about 42 feet above sea level; the top of the bank is about 52 feet in elevation.

Collected by H. V. Howe, H. N. Fisk and W. D. Chawner.

7. Grandview Bluff, Caldwell Parish.

From W. D. Chawner:

Base of the Jackson occurs at about 55 feet above sea level. Above the base of the Jackson are 5 or 6 feet of Moody's Branch, consisting of shell marl with calcareous concretions.

The material collected by H. V. Howe came from this Moody's Branch Marl.

8. Heison Bluff, Caldwell Parish.

The material examined was collected by H. V. Howe in SW¼ of SW¼, Sec. 12, T. 12N., R. 4E., at an elevation of 112 feet above sea level. (Jackson, Moody's Branch Marl).

9. Gibson Landing on the Ouachita River, Caldwell Parish.

Collected by R. W. Harris. (Jackson, Moody's Branch Marl).

10. Stock Landing, Caldwell Parish.

The material was collected by H. V. Howe and W. D. Chawner from 8 feet below the top of the bluff at 177 feet. (Jackson, Moody's Branch Marl).

11. Sabine Parish, SE¼, NW¼, Sec. 13, T. 5N., R. 11W.

(Jackson, Moody's Branch Marl). Collected by R. B. Grigsby.

12. Creole Bluff at Montgomery, La Salle Parish. Center N½

Sec. 20, T. 8N., R. 5W.

Collected by H. N. Fisk, W. D. Chawner and H. V. Howe in the lower six feet of the Moody's Branch Marl.

13. Tullos, La Salle Parish. One-half mile northeast of Tullos in a borrow pit for fill on the Tullos-Winnfield Highway No. 474 overhead crossing, center SW¼, SW¼, Sec. 22, T. 10N., R. 1E. (Jackson, Moody's Branch Marl). Collected by H. N. Fisk and W. D. Chawner.
14. One-fourth mile west on Highway No. 474 from locality 12; in NE¼ of SE¼ of Sec. 23, T. 10N., R. 1E., .7 mile from Tullos. Collected by H. N. Fisk.
15. Two and six-tenths miles southeast of Arcadia, Bienville Parish, on Highway No. 10, in southeast corner of NW¼, Sec. 28, T. 18N., R. 5W. Collected by R. D. Russell.
16. St. Maurice, Winn Parish. Collected by H. V. Howe at the railroad crossing over Saline Bayou. (Saline Bayou member of Cook Mountain formation).

Descriptions of Species

Class BRYOZOA Ehrenberg, 1831

Subclass Ectoprocta Nitsche, 1869

Superorder 1 Gymnolaemata Allman

Order Cheilostomata Busk

Suborder Anasca Levinsen

Division 1 Malacostego Levinsen, 1909

Family Membraniporidae Busk, 1854

Genus Conopeum Gray, 1848

Conopeum hoockeri Haime

Plate 14, figures 2, 11

Membranipora hoockeri Haime in D'Archiac's Description des animaux fossiles du groupe nummulitique de l'Inde, Memoires Societe Geologique France, ser. 2, vol. 3, p. 227, pl. 36, fig. 5, 1850.

Membranipora hoockeri Reuss, Die fossilen Anthozoen und Bryozoen der Schichtengruppe von Crosaro, Deknschriften derk. Akademie der Wissenschaften, Wien, vol. 29, p. 40, pl. 36, fig. 14, 1869.

Membranipora hoockeri Waters, North Italian Bryozoa, Quarterly Journal Geological Society, London, vol. 47,p. 13, 1891.

Conopeum hoockeri Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 91, pl. 19, figs. 8-10, 1920.

> The zoarium incrusts shells. The zooecia have a marked luster and are distinct, elongate, somewhat narrowed posteriorly; the mural rim is very thin, and sharply outlined, little enlarged at the base; the gymnocyst is very convex. The opesium is regular in outline and elliptical. The interopesial cavities are fusiform but rarely developed. The dorsal bears two distal impressions which are excavated in the substratum. There is a distal septula and two septulae on each lateral wall.

The zooecia are 0.35-0.45 mm. long and 0.22-0.26 mm. wide.

Theopesia are 0.28-0.35 mm. long and 0.12-0.20 mm. wide.

The above dimensions correspond with those of Canu and Bassler. The greatly developed gymnocyst is characteristic of this species.

Occurrence: Lower Jackson: Montgomery, Louisiana (rare).

Morphotype: Louisiana State University Museum Collection No. 1200.

Conopeum lamellosum Canu and Bassler

Plate 14, figures 5-6, 9.

Conopeum lamellosum, Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 92, pl. 20, figs. 1-9, 1920.

> The zoaria are large undulating fronds formed of multiple lamellae growing back to back. The zooecia are distinct, somewhat elongate, elliptical; the mural rim is flat, finely punctate, projecting distally, and enlarged at the base into a small cryptocyst. The opesium is regular, elliptical, entire or very finely crenulated. On the dorsal oiocyst there are two large distal impressions. The very large distal septula is double in the primoserial zooecia. There are three septulae to each lateral wall. The interopesial cavities are very small, triangular, and rather constant.

Measurements:

Length of zooecia -- 0.40-0.50 mm.

Width of zooecia -- 0.30-0.36 mm.

Length of opesium -- 0.30-0.40 mm.

Width of opesium -- 0.18-0.23 mm.

The measurements on several specimens show the variations in the size of the zooecia. The zoarial form differentiates this species.

Occurrence: Lower Jackson: Montgomery, (very common); Tullos, (common); Bunker Hill, (rare).

Morphotype: Louisiana State University Museum Collection No. 1241.

Conopeum wilcoxianicum Canu and Bassler, var. ouachitaensis McGuirt, n. var.

Plate 14, figures 3,7.

The zoarium is fragile and composed of one or two lamellae. The zooecia are variable in size, generally elliptical. The thin mural rim is slightly enlarged proximally. The cavities between the opesia are large and elongated. There is a large distal septula and two small lateral septulae. Three distal depressions may be present on the irregular substratum.

The length and width of the zooecia vary from 0.35 mm. to 0.44 mm., and from 0.22 mm. to 0.30 mm. respectively.

The thin and finely granulated mural rim, and the small dimensions are distinctive.

Cotypes: Louisiana State University Museum Collection No. 1242, from Bunker Hill Louisiana.

Conopeum sp.

Plate 14, figures 8, 10.

The zoarium is the incrusting type. The mural rim of the irregular but distinct zooecia is oval and well developed. The little developed gymnocyst is slightly convex. The oval opesium is closed on some zooecia. Interopesial cavities are commonly present.

The zooecia average 0.40 mm. long and are 0.23 mm. in width. The opesia vary from 0.20 to 0.28 mm. in length.

This species differs from C. lacroxii in that it is smaller and has separated mural rims.

Three fragments of the species were observed from Stock Landing, Louisiana.

Louisiana State University Museum Collection No. 1243.

Conopeum sp.

Plate 5, figures 1-2.

The only specimen found is incrusting. The zooecia are fragile, oriented, elliptical. The substratum of the zooecia is in some instances depressed. The very small interopesial cavities have a prominent lip partially surrounding them.

The zooecia average 0.40 mm. in length, and 0.28 mm. in width. The opesia have an average length of 0.32 mm.

Louisiana State University Museum Collection No. 1244, from Rosefield, Louisiana.

Genus Acanthodesia Canu and Bassler, 1919

Acanthodesia sp.

Plate 14, figures 1, 4.

The zoarium is incrusting. The zooecia are oriented, oval, large. The mural rim is enlarged at the base, forming a flat cryptocyst. The rim is separated by furrows. There are three lateral and one dorsal septulae.

The spinous processes of Acanthodesia Canu and Bassler, 1920, were not present on the specimens observed.

The zooecia are 0.43-0.53 mm. long and 0.30 mm. wide. The opesium has an average width of 0.15 mm.

Only two specimens of this species were observed; both from Montgomery.

Louisiana State University Museum Collection No. 1249.

Genus Cupuladria Canu and Bassler, 1919

Cupuladria canariensis Busk

Plate 1, figures 1-3, 5-6, 8.

Cupuladria canariensis Busk, Monograph fossil polyzoa of the Crag, Publications Paleontographical Society, London, Vol. 14, p. 87, pl. 13, fig. 2, 1859.

Cupuladria canariensis Canu and Bassler, U. S. Nat. Mus. Bull. 125, p. 28, pl. 1, figs. 7-9, 1923.

Canu and Bassler state:

> "This abundant, well-known fossil and recent species, distinguished by its free, cupuliform zoarium with the zooecia on the convex side having a membraniporoid opesium and vibracula and with the concave side marked by distinct polygonal areas pierced by a few large pores, has been found fossil at a number of American localities starting in the Lower Miocene and continuing to the present time. In its geological occurrence it agrees with Cupularia umbellata Defrance, 1823, which likewise begins in the Lower Miocene."

Microscopic measurements point out the variations in the size of the opesia, zooecia, and vibraculae. Both large and small pores are present on the inner face of the zoarium and in some specimens makes it difficult to distinguish this species from C. biporosa.

The zooecia are usually rectangular on the inner side.

The zooecia have a length of 0.36-0.50 mm. The opesia are 0.13-0.20 mm. long.

Occurs commonly in the Lower Miocene, (Heterostegina zone), and the Upper Miocene and Pliocene of south Louisiana.

Occurrences: Superior Oil Producing Company's Hernandez No. 1 well, 7950 feet, 7991-7999 feet and 8373-8393 feet, Sec. 34, T. 8S., R. 3E., Acadia Parish; Superior Oil Producing Company's Duplantier Community No. 1 well, 7671-7687 and

8091-8101 feet, Sec. 65, T. 7S., R. 1W., East Baton Rouge Parish; Terrebonne Gas Co., Fee No. 1 well, 2300', Terrebonne Parish.

Morphotype: Louisiana State University Museum Collection No. 1253, from 7950 feet in Superior Oil Prod. Co., Hernandez No. 1, and 2300 feet in Terrebonne Gas Co., Fee No. 1.

Genus Membraniporina Levinsen, 1909

Membraniporina tubulosa Canu and Bassler

Plate 5, figures 3-5, 7.

Membraniporina tubulosa Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 98, pl. 80, figs. 2-7, 1920.

> The zoarium is unilaminar, tubular, and incrusts very small algae. The zooecia are distinct, elongated, hexagonal; the mural rim is level, but little elevated, much enlarged at the base to form a concave cryptocyst. The opesium is anterior, elliptical, entire; the lateral walls bear two small septulae.

The opesia average 0.21 mm. in length and 0.17 mm. in width.

Occurrence: Vicksburg: Rosefield, Louisiana (very rare).

Morphotype: Louisiana State University Museum Collection No. 1258.

Genus Otionella Canu and Bassler, 1917

Otionella perforata Canu and Bassler

Plate 15, figures, 2, 6, 10.

Otionella perforata Canu and Bassler, U. S. Nat. Mus. Bull. 96, p. 13, pl. 1, figs. 3, 4, 1917.

Otionella perforata Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 106, pl. 11, figs. 7-19, 1920.

> The zoarium is discoidal with a concave inner face. The zooecia are ogival in shape, broad, distinct, separated by a furrow, disposed in very irregular radial and transverse lines; the mural rim is broad on the sides and below with a projecting summit; the opesium is elliptical, little elongated, nearly orbicular, bordered by a projecting collar. The vibraculum is as large as the zooecium, unsymmetrical and auriculated, rather narrow. On the inner face the radial ribs are perforated with numerous pores. There are at least two pairs of large lateral septula to each zooecium, and only one pair in the vibraculum.

The zooecia have an average length of 0.23 mm., and the vibracula are 0.20-0.26 mm. long.

The vibracula of this species are much smaller than O. tuberosa Canu and Bassler.

Occurrence: Claiborne (Cook Mountain formation): St. Maurice, Louisiana (common); 2.6 miles southeast of Arcadia. Lower Jackson: Montgomery, Louisiana (common); Gibson Landing, Heison Bluff, and Bunker Hill, Ouachita River, Louisiana (rare); Tullos (common).

Morphotype: Louisiana State University Museum Collection No. 1262.

Otionella tuberosa Canu and Bassler

Plate 15, figures 1, 5, 7.

Otionella tuberosa, Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 107, pl. 12, figs. 5-15, 1920.

> The zoarium is discoidal, with a concave inner face. The zooecia are hexagonal, somewhat indistinct, joined by their mural rims, disposed apparently in irregular quincunx; the mural rim is concave, broad, especially at the base. The opesium is elliptical or nearly orbicular and bordered by a prominent collar. The vibraculum is interzooecial, asymmetrical, larger than the zooecium. The inner face is but slightly concave; the radial ribs are smooth and perforated with some small scattered pores or ornamented with large tuberosities.

The vibracula are in some instances much larger than those of Canu and Bassler, but as the variations may be found on a single specimen, fig. 6, no attempt is made to separate the species.

The zooecium is 0.32 mm. long and 0.23 mm. wide; the vibraculum has a length of 0.35-0.43 mm. and a width of 0.20-0.30 mm.

This species is characterized by its large vibraculum.

Occurrence: Upper Jackson: Danville Landing, Ouachita River, Louisiana (very common); Lower Jackson: Montgomery (rare); Bunker Hill (common); Gibson Landing (rare); Sabine Parish, T. 5N., R. 11W. (rare); Grandview; Heison Bluff and Stock Landing.

Morphotype: Louisiana State University Museum Collection No. 1262.

Genus Trochopora D'Orbigny, 1849

Trochopora bouei Lea

Plate 15, figures 3-4, 9, 11.

Lunulites bouei Lea, Contributions to Geology, p. 189, pl. 6, 1833.

Trochopora bouei Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 103, pl. 10, figs. 1-17, 1920. (For complete synonomy see Canu and Bassler).

> The zoarium is Lunulites in form, slightly convex, with the inner face concave. The zooecia are elongated, pyriform, distinct, the mural rim is regular, convex, projecting distally. The opesium is entire, pyriform. The ancestrular zooecia are normal or radicular. The vibracula are small, narrow, symmetrical, with neither condyle nor small canal. On the inner face the disks are thinner at the center; they are formed of radial costules with the zooecia in one row and perforated with a line of irregular pores. A large distal septula is present.

Occurrence: Claiborne (Cook Mountain formation): St. Maurice, Louisiana (abundant). Lower Jackson: Gibson Landing, Bunker Hill, Grandview and Heison Landing, Ouachita River, Louisiana (very rare); Tullos, and Montgomery.

Morphotype: Louisiana State University Museum Collection No. 1265.

Trochopora truncata De Gregorio

Plate 15, figure 8.

Lunulites (Discoflustrellaria) bouei, var. truncata De Gregorio Monograph de la Faune Eocenique de l'Alabama et surtout de celle de Claiborne de l'Etage Parisien; Annales de Geologie et de Paleontologie, Livraisons 7, 8, p. 245, pl. 41, figs. 34-41, 1890.

Trochopora truncata Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 104, pl. 11, figs. 1-6, 1920.

> The zoarium is a conical Lunulites, solid, formed of successive disks. The zooecia are hexagonal, distinct, arranged in radial and circular rows; the mural rim is thin, sharp, irregular, and gashed. The opesium is irregular. The ancestrular zooecia never cover the grain of quartz to which the larva affixes itself. The vibracula are not very constant; they are at first very small, increasing in size toward the periphery and becoming primoserial. On the inner face the radial rows are flat; smooth at the center, very porous at the circumference.

The zooecia are 0.2 mm. long and 0.15 mm. wide.

On the better preserved specimen the zooecia may have covered the quartz grain more than fig. 8 indicates.

This species is characterized by the flat inner side with the perforations, its dimensions, and the disks that comprise it.

Occurrence: Lower Jackson: Montgomery (very rare).

Morphotype: Louisiana State University Museum Collection No. 1266.

Family Hincksinidae Canu and Bassler, 1927

Genus Vibracellina Canu and Bassler, 1917

Vibracellina montgomeryensis McGuirt, n. sp.

Plate 16, figures 1, 4.

The zoarium incrusts shells. The zooecia are distinct, oval; gymnocyst small, convex; the mural rim is convex and thin. The opesium is oval and has fine denticulations. The vibracula are constant, and have a salient lip on each side of its opesium.

The constant vibracula and denticulate opesia distinguishes this species from V. capillaria of the Cook Mountain formation.

This species has been found in the Lower Jackson at Montgomery, Louisiana, and the Claiborne 2.6 miles southeast of Arcadia.

Length of zooecia - 0.20-0.31 mm.

Length of vibracula - 0.10 mm.

Cotype No. 1270, Louisiana State University Museum Collection.

Family Alderinidae Canu and Bassler, 1927

Genus Amphiblestrum Gray, 1848

Amphiblestrum chawneri McGuirt, n. sp.

Plate 16, figures 3, 9-10.

The zooecia of the incrusting zoarium are subrectangular to oval, separated by an irregular and narrow furrow; the mural rim is very wide, ornamented with extremely fine radial granules, and containing numerous dietallae. The opesium is elongate, narrow. The interopesial avicularia are small, elliptical, irregular.

Length of zooecia - 0.35 mm. (average)

Width of zooecia - 0.18 mm. (average)

The broad, finely granulated mural rims and narrow zooecia are characteristic of this species. The normal zooecia may be nearly closed, having circular pores that vary in size.

This species occurs very rarely at Montgomery, Louisiana.

Named in honor of W. D. Chawner, whose aid in collecting material was invaluable.

Holotype: No. 1274, Louisiana State University Museum Collection.

Amphiblestrum rectum Canu and Bassler

Plate 16, figures 2, 5.

Membrandoecium rectum Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 122, pl. 13, figs. 1-8, 1920.

> The zoarium incrusts other bryozoa and pebbles. The zooecia are elongate, distinct, oval; the mural rim is salient, smooth, a little widened on the margins, very much widened at the base, with five distal dietellae. The opesium is oval, entire. The ovicell is endozoecial and is a small, smooth, distal convexity. The avicularia are small, straight, salient, and elliptical. The ancestrula is a very small, closed zooecium.

The zooecia have an average length of 0.33 mm. and an average width of 0.24 mm.

Morphotype: Louisiana State University Museum Collection No. 1275, from Montgomery, Louisiana (very rare).

Genus Callopora Gray, 1848

Callopora filoparietis Canu and Bassler,

var. montgomeryensis McGuirt, n. var.

Plate 16, figures 7, 11.

The zoarium is incrusting. The small zooecia are slightly elongated, distinctly separated. The mural rim is thin, regular, denticulated. The ovicell is hyperstomial and comes to a point at the top. The small, elliptical, interopesial avicularia are rare.

The opesia averages 0.20 mm. in length and 0.14 mm. in width.

The small zooecia, pointed ovicells, and denticulations on the mural rims are distinct.

Holotype: Louisiana State University Museum Collection No. 1279, occurs very rarely at Montgomery.

Genus Callopora Gray, 1848

Callopora montgomeryensis McGuirt, n. sp.

Plate 16, figures 6, 8.

The zoarium is incrusting. The zooecia are elongated, irregularly elliptical. The mural rims are thin, slightly thickened posteriorly, granulated, and have several dietallae. The distal ovicell is very small, smooth, raised. The avicularia, usually two in number and symmetrical, but occasionally number one or three, are placed below each zooecium.

Length of zooecium - 0.38 mm. (average)

Length of opesia - 0.20-0.34 mm.

Width of opesia - 0.12-0.20 mm.

Specimens of the small zooecia with the thin mural rims and conspicuous symmetrical avicularia are found rarely in the Lower Jackson at Montgomery, Louisiana, and at Stock Landing.

Cotypes: No. 1280, Louisiana State University Museum Collection.

Genus Ellisina Norman, 1903

Ellisina claibornensis McGuirt, n. sp.

Plate 31, figures 2-3, 5-6.

The zoarium is free and unilamellar. The zooecia are large, wide, separated by a distinct narrow furrow. The granular mural rims are round and prominent. There are two mural rims displayed on some of the zooecia. The posterior large avicularium is oblique and oval. There are two denticles to each avicularium. The dietallae open into the zooecia and are numerous and very large. The two symmetrical distal dietallae are much enlarged.

No ovicells were observed on the specimens examined.

The zooecia are 0.74 mm. long, and 0.50 mm. wide. The avicularia average 0.20 mm. in length.

The species occurs rarely at St. Maurice.

Cotypes: Louisiana State University Museum Collection No. 1284.

Genus Membraniporidra Canu and Bassler, 1917

Membraniporidra spissimuralis Canu and Bassler

Plate 5, figures 6, 8-11.

Membraniporidra spissimuralis Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 136, pl. 27, figs. 1-19; pl. 28, figs. 1-7, 1920.

> The zoarium is free, follicular, formed of two lamella growing back to back and easily separable. The zooecia are elongated, oval, distinct, separated by a furrow or by a raised thread-like line. The mural rim is flat, oblique toward the opesium, thick gradually enlarging to form at the base a cryptocyst limited laterally by two grooves or furrows. The opesium is elliptical, entire, often partially cut off by the rectangular prominent denticles. The primoserial zooecia have an opesium narrowed laterally. The ovicell is globular, salient, short, transverse, and is deeply embedded in the distal zooecium. There are two pairs of lateral septulae and a very large distal septula.
>
> Length of zooecia - 0.50-0.75 mm.
>
> Width of zooecia - 0.35-0.50 mm.
>
> Length of opesia - 0.43-0.62 mm.
>
> Width of opesia - 0.23-0.32 mm.

This species is quite variable as can be seen from the figures. Figure 8 shows clearly these variations.

Occurrence: Vicksburg: Rosefield, Louisiana (rare).

Morphotype: No. 1288, Louisiana State University Museum Collection.

Genus Stamenocella Canu and Bassler, 1917

Stamenocella mediaviculifera Canu and Bassler

Plate 17, figure 10.

Stamenocella mediaviculifera Canu and Bassler, Syhopsis of American Early Tertiary Cheilostome Bryozoan, Bull. 96, U. S. Nat. Mus., p. 22, pl. 3, fig. 1, 1917.

Stamenocella mediaviculifera Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 171, pl. 31, figs. 1-5, 1920.

> The zoarium is bilamellar, with the two lamellae back to back and inseparable. The zooecia are very elongated, narrowed behind, distinct or indistinct; the mural rim is thin, salient, somewhat enlarged and attenuated, rounded, smooth. The opesium is elliptical, or oval, entire; the gymnocyst is flat or somewhat convex and nearly as long as the opesium. The avicularium is salient and placed in the middle of the gymnocyst. The ovicell is rarely intact.

The zooecia are 0.64-0.74 mm. long and 0.22-0.26 mm. wide; the length of the opesium is 0.38-0.52 mm.

The above dimensions vary somewhat from those of S. mediaviculifera Canu and Bassler, but because of the position of the avicularia and other similarities, the specimen is not separated from this species.

Occurrence: Jackson: Stock Landing, Louisiana (very rare).

Morphotype: No. 1292, Louisiana State University Museum Collection.

Stamenocella anatina Canu and Bassler

Plate 17, figure 5.

Stamenocella anatina, Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 169, pl. 30, fig. 12, 1920.

> The zoarium is free and bilamellar; it is formed of large, flat fronds; the two lamellae are inseparable and back to back. The zooecia are very large, elongated, distinct, separated by a furrow; the mural rim is little salient, flat, oblique, thin distally, much enlarged and transformed into a cryptocyst proximally; the gymnocyst is little convex and smooth. The opesium is anterior, elliptical, entire. The avicularium occupies the surface of the gymnocyst; it is large, salient, and terminated like the beak of a duck, with spatulate mandible.

Zooecia - Length 0.72 mm.
Width 0.32 mm.

Opesia - Length 0.38-0.42 mm.

From Heison Bluff only one fragment of this species was observed.

The dimensions and avicularium are definite for the determination of the specimen.

Morphotype: No. 1293, Louisiana State University Museum Collection.

Stamenocella inferaviculifera Canu and Bassler

Plate 6, figures 1-2, 4, 7.

Stamenocella inferaviculifera Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 172, pl. 31, figs. 6-15, 1920.

> The zoarium is free with the two lamellae inseparable and growing back to back. The zooecia are elongated, distinct, narrowed in back; the mural rim is little salient, very thin, attenuate at its base. The opesium is elliptical or oval, entire; the gymnocyst is flat, smooth. The marginal zooecia have no avicularia. The ovicell is small, globular, fragile, placed on the gymnocyst of the distal zooecia, closed by the operculum. The avicularium is situated on the inferior portion of the gymnocyst in close contact with the mural rims of the proximal zooecium.
>
> Length of zooecia - 0.56-0.70 mm.
>
> Length of opesium - 0.30-0.44 mm.
>
> Width of opesium - 0.10-0.16 mm.

There are two pairs of lateral septulae and one distal septula. The presence of these micro-pores were not included in the original description.

The position of the avicularia, and the dimensions of the zooecia and opesia characterizes this species. The pivots of the avicularia are shown in Figure No. 2.

Occurrence: The Vicksburg specimen doubtfully referred to this species is pictured (fig. 4). It has punctations replacing the avicularia. The Vicksburg specimen has somewhat smaller dimensions than those of the Jackson. Lower Jackson: Montgomery (common); Tullos (common); Heison Bluff (common); Stock Landing; Grandview; and Bunker Hill. Vicksburg: Rosefield (doubtful).

Pleisotype: Louisiana State University Museum Collection No. 1294.

Stamenocella howei McGuirt, n. sp.

Plate 2, figures 8-9, 12.

The zoarium is bilamellar, with lamellae back to back, narrow, and inseparable. The zooecia are extremely long, very narrow behind; the mural rim is thin, moderately convex, smooth and not too distinct. The opesium is elliptical, narrowed to a point proximally. The gymnocyst is two-fifths the length of the opesium, slightly convex, smooth, and contains a conspicuous avicularium. The avicularium is placed near the middle of the gymnocyst.

Length of zooecia measure - 0.68-0.75 mm.

Length of opesia measure - 0.48-0.52 mm.

Width of opesia varies from- 0.11-0.18 mm.

This species is easily differentiated by its micrometric dimensions and its tear-shaped opesium.

Occurrence: Lower Miocene (Heterostegina zone): Shell Petroleum Company, Hernandez No. 1 well, 8210-34 feet (common).

The species is named in honor of Dr. H. V. Howe, Director, School of Geology, Louisiana State University, and Louisiana Geological Survey, Research Division, for his many suggestions and help in preparing this report.

Cotype: No. 1295, Louisiana State University Museum Collection.

Division 2. Coilostega Levinsen, 1909

Family Microporidae Hincks, 1880

Genus Reptolunulites D'Orbigny, 1852

Reptolunulites Jacksonensis Canu and Bassler

Plate 17, figures 3, 11.

Lunularia jacksonensis Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 250, pl. 37, figs. 19-22, 1920.

> The zoarium is a somewhat convex Lunulites. The zooecia are distinct, rectangular, disposed in radial and circular rows; the mural rim salient. The cryptocyst is smooth, sunken, little developed; the opesium is large, oval, enlarged at the base. The vibracula are placed in distinct radial rows in all the interzooecial angles; they are symmetrical and bear two lateral condyles. The hydrostatic zooecia are numerous, closed by an irregular, nonperforated olocyst. The inner face bears large, radial tuberose costules.

Zooecia - Length 0.30-0.40 mm.
Width 0.28-0.35 mm.

Opesia - Length 0.15-0.23 mm.

This species is characterized by the minute scattered pores on the inner face and the flatter zoarium.

Occurrence: Lower Jackson: Montgomery, Louisiana (common); Tullos, Stock Landing; Gibson Landing; Heison Bluff; and Grandview.

Morphotype: Louisiana State University Museum Collection No. 1300.

Reptolunulites grandipora Canu and Bassler, var.
claibornensis McGuirt, n. var.
Plate 31, figures 8-10.

The deep zooecia of the orbicular zoarium are large and arranged in radial rows. The mural rim is thick, granulated, depressed in the middle, conspicuous distally. There are two well developed condyles in the constant interzooecial vibracula. The opesium is large, narrower toward the distal end, crenulated. On the inner side the ribs are slightly convex and tuberose. The endozooecial ovicell, rarely developed, occupies a portion of the elevated mural rim.

Average length of zooecium - 0.40 mm.
" " " opesium - 0.32 mm.

This variety found commonly at St. Maurice and 2.6 miles southeast of Arcadia, differs from R. grandipora in having smaller zooecia and a distinct lozenge-shaped vibraculum.

Holotypes: Louisiana State University Museum Collection No. 1301.

Reptolunulites tintinabula Canu and Bassler

Plate 6, figures 3, 5, 10.

Lunularia tintinabula Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 251, pl. 83, figs. 12-16, 1920.

> The zoarium is a Lunulites in the form of a little bell with hydrostatic zooecia. The zooecia are distinct, elongated, ogival; the mural rim is thin; the cryptocyst is quite concave, smooth, much shorter than the opesium. The opesium is oval, elongated, largely surrounded by a salient peristome. The vibracula are arranged in radial rows; they are symmetrical, oval; their opesium is narrowed laterally by two teeth; the anterior portion is much larger than the inferior portion. The hydrostatic zooecia bear a prominent thread, distal semilunar. On the inner side the radial rows are quite convex and garnished with large scattered pores. The zoarial surface is pelliculoid.

Zooecia - Length 0.40 mm. (average)
Width 0.25-0.30 mm.

Vibracula - Length 0.20-0.25 mm.

The vibracula are placed in all the interzooecial angles, a feature that differentiates it from Lunularia vicksburgensis, Canu and Bassler. This species differs from Lunularia jacksonensis in its porous inner face.

Occurrence: Vicksburg: Rosefield, Louisiana.

Morphotype: Louisiana State University Museum Collection No. 1302.

Reptolunulites ligulata Canu and Bassler

Plate 7, figures 1, 4, 6, 10.

Plate 18, figure 1.

Lunularia ligulata Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 243, pl. 13, figs. 10-12, 1920.

> The zoarium is a concave Lunulites, much expanded. The zooecia are rectangular, transverse, distinct; the mural rim is thick and distinct from the cryptocyst, which is deep, smaller than the opesium, and very finely granulated. The opesium, orbicular or elliptical, is surrounded by a prominent collar. The ovicell is a large distal convexity. The hydrostatic zooecia have a false opesium partially obstructed by a wide calcerous tongue. The vibracula are elongated, narrow fusiform, deeply embedded, disposed in distinct rows. The inner side has flat or slightly convex radial ribs, perforated with small, scattered pores.

Zooecia - Length 0.20-0.26 mm.
Width 0.24-0.32 mm.

Opesium - Length 0.10-0.13 mm.

The tongue-like processes on the zooecia are often connected on both ends. In addition to this specific characteristic, the zooecia are small, wider than long.

Occurrence: Lower Jackson: Montgomery (rare); Tullos (rare); Gibson Landing (rare); Heison Bluff; and Stock Landing. Vicksburg: Rosefield, Louisiana (rare).

Morphotype: Louisiana State University Museum Collection No. 1303.

Reptolunulites fenestrata De Gregorio

Plate 7, figures 2-3, 5, 8.

Dimiclausa fenestrata De Gregorio, Monograph de la Faune Eocenique de Alabama. Annales de Geologie, et de Paleontologie, Livraisons 7, 8, p. 249, pl. 42, figs. 23-27, 1890.

Lunularia fenestrata Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 244, pl. 37, figs. 10-13, 1920.

> The zoarium is a small, convex, expanded Lunulites with the zooecia and vibracula in distinct, alternating radial rows. The zooecia are rectangular, somewhat transverse, distinct, ogival; the mural rim is thick; the cryptocyst very small; the opesium is large, elongated, elliptical. The ovicell is a large distal convexity. The ancestrular zooecia are hydrostatic and calcified with four opesiular openings like a window. The vibraculum is long, narrow, fusiform, deep, primoserial in the middle, but in distinct rows along the margins. The inner side is formed of large, radial, convex ribs with small pores far apart. A large, distal septula and two pairs of large, lateral septula are present.

The zooecia have an average length of 0.26 mm. and width of 0.29 mm. The vibracula are 0.15-0.25 mm. long.

The figured zooecia appear to be more transverse than those of Canu and Bassler. The cryptocyst of the marginal zooecium is very fragile.

The hydrostatic zooecia perforated by the four pores separates this species from Lunularia ligulata.

Occurrence: Lower Jackson: Gibson Landing, Ouachita River, Louisiana (very rare); Montgomery, Louisiana (common).

Morphotype: Louisiana State University Museum Collection No. 1304.

Reptolunulites (Oligotresium) vicksburgensis Conrad

Platey 6, figures 6, 8-9, 11.

Lunulites vicksburgensis Conrad, Observations on the Eocene formation of one hundred and five fossils of that period, from the vicinity of Vicksburg, Mississippi, with an appendix, Proceedings Academy Natural Sciences Philadelphia, vol. 3, p. 296, 1847; Journal Academy Natural Sciences Philadelphia, ser. 2, vol. 1, p. 127, idem 1848.

Oligotresium vicksburgensis Gabb and Horn, Monograph of the fossil polyzoa of the Secondary and Tertiary formations of North America, Journal Academy Natural Sciences Philadelphia, ser. 2, vol. 5, p. 139, pl. 19, fig. 22, 1862.

Lunularia (Oligotresium) vicksburgensis Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 249, pl. 83, figs. 1-11, 1920.

> The zoarium is a convex expanded Lunulites, without hydrostatic zooecia. The zooecia are distinct, ogival, somewhat transverse; the mural rim is very thick; the cryptocyst is very small and finely granulated. The opesium is oval, narrowest at the top, the proximal border quite concave; it is bordered by a small collar. The ovicell is a distal convexity hidden by the external calcification. The vibraculum is very long; its opesium is large and narrowed in the upper third by two large condyles with a small fossette. The vibracula are arranged in radial rows, but there is only one to every two interzooecial angles. On the inner side the radial lines are convex and garnished with large scattered pores. One pair of lateral septulae.

The zooecia are 0.30-0.40 mm. long and 0.30-0.35 mm. wide; the vibracula have a length of 0.20-0.35 mm. These dimensions show that the zooecia are only slightly transverse.

The vibracula are variable in size and position. The zoaria may be large or small; the small ones have the smallest zooecia. This species has the thickest zoarium in proportion to the diameter of any specimen assigned to this genus from Louisiana.

Occurrence: Vicksburg: Rosefield, Louisiana (very

common).

Morphotype: Louisiana State University Museum Collection No. 1305.

Reptolunulites bassleri McGuirt, n. sp.

Plate 17, figures 1-2, 9.

The zoarium is a slightly convex Lunulites. The large zooecia are disposed in radial and circular rows, elongated, separated by a salient thread or a furrow. The mural rim is well developed, raised distally, finely crenulated. The opesium is oval, finely crenulated. There is no cryptocyst. The vibracula are arranged in distinct rows, interzooecial, oval in shape, with two short lateral condyles. There are two pairs of lateral and one or two distal septula. The ribs of the inner side are convex, perforated by small scattered pores, and adorned with large tubercles.

The zooecia average 0.57 mm. in length and 0.40 mm. in width; the opesium is 0.40-0.50 mm. long and 0.25-0.30 mm. wide.

The very large zooecia with the coarsely tuberose and perforated ribs on the inner face, in addition to the consistently open zooecia, differentiates this species from the others. The radial rows are easily separable.

This species is named in honor of Dr. Ray S. Bassler, Division of Paleontology, United States National Museum.

Occurrence: Lower Jackson: Montgomery, Louisiana (rare).

Holotype: Louisiana State University Museum Collection No. 1306.

Reptolunulites bassleri var. montgomeryensis
McGuirt, n. var.
Plate 17, figures 4, 6-8.

The zoarium is a flat Lunulites. The zooecia are rectangular, elongate, prominent; the medium, granulated mural rim is well developed, produced distally to a high peak; the small cryptocyst is expanded laterally to give a sub-penduriform shape to the opesium. The vibracula are regular, oval, with two condyles distally situated. The inner side has ribs perforated by one row of large, widely spaced pores.

Zooecia - Length 0.36-0.45 mm.
Width 0.28-0.40 mm.

Opesia - Length 0.30-0.35 mm.

This variety, collected from Montgomery, Louisiana, differs from Reptolunulites bassleri in that it has smaller dimensions and a peculiar shape to the opesium.

Cotype: No. 1307, Louisiana State University Museum Collection.

Genus Onychocella Jullien, 1881

Onychocella celsa Canu and Bassler, var. montgomeryensis McGuirt, n. var.

Plate 18, figures 4, 6.

The zoarium is unilamellar. The zooecia are distinct, sub-hexagonal, long. The cryptocyst is deep, granulated, longer than the opesium. The opesiular indentations are irregular and small. A slight polypidian convexity is noticeable on the majority of zooecia. The narrow onychocellaria are slightly curved, longer than the zooecia, and pointed below.

Average length of zooecia - 0.40 mm.

Average width of zooecia - 0.30 mm.

Average length of onychocellaria - 0.45 mm.

The single specimen observed may be an incrusting type that has become separated. It differs from O. celsa in its granulations, less conspicuous convexity, and smaller dimensions.

Occurrence: Jackson: Montgomery, Louisiana (very rare).

Holotype: Louisiana State University Museum Collection No. 1311.

Genus Floridinella Canu and Bassler, 1917

Floridinella sp.

Plate 18, figures 2-3.

The zoarium is free, unilamellar. The zooecia are broad, little distinct; the cryptocyst and mural rim are smooth; the mural rim is broad and indistinct. The opesium is small, suboval, with two teeth separating a small distal portion of the opesium from the proximal part.

Zooecia - Length 0.40 mm.
Width 0.30 mm.

The opesiules and mural rim are shown in Fig. No. 2. Only three small fragments of the specieswere obtained at the Tullos locality.

Figured specimen No. 1314, Louisiana State University Museum Collection.

Genus Micropora Gray, 1848

Micropora ? sp.

Plate 9, figure 3.

The zoarium is small and incrusting. The small zooecia (0.30-0.40 mm. long), have a minutely perforated, convex frontal. The aperture is oval, with two inconspicuous cardelles separating a smaller proximal portion from the distal portion. The thin peristome is more developed on the distal side of the round peristomice. Two zooecia have adventitious avicularia.

No ovicells were present on the only specimen observed.

Occurrence: The specimen collected at Montgomery may represent a new genus. However, more material will be necessary for a definite determination.

Specimen No. 1317, Louisiana State University Museum Collection.

Genus Selenaria Busk, 1854

Selenaria auricularia Canu and Bassler

Plate 31, figures 4, 7.

Selenaria auricularia Canu and Bassler, U. S. Nat. Mus. Bull. 125, p. 59-60, fig. 5, 1923.

The large auriform vibracula, and deep cryptocyst perforated by two equal opesiules are characteristic of this distinct species. The radial rows on the inner face of the specimens observed are convex, regular, perforated by numerous pores.

Occurrence: Claiborne formation: St. Maurice, Louisiana (common).

Morphotype: Louisiana State University Museum Collection No. 1320.

Family Calpensiidae Canu and Bassler, 1923

Genus Discoporella D'Orbigny, 1852

Discoporella doma D'Orbigny

Plate 2, figures 1, 4.

Discoflustrellaria doma D'Orbigny, Paleontologie francaise, Terrain Cretace, vol. 5, Bryozoaires, p. 561, 1851.

Cupularia doma Canu and Bassler, U. S. Nat. Mus. Bull. 125, p. 77, pl. 1, fig. 18; pl. 15, figs. 1-5, 1923. (For further references see Canu and Bassler, U. S. Nat. Mus. Bull. 125, 1923, p. 77).

The following is the original description:

> Conical species, raised, very thick, cells obliterated in the center, all rhomboidal, regular, letting the special pore project strongly to the circumference. Very rough underneath, prickly, with indications of rays. Living by the side of Algeria. Our collection.

This species possesses spinous processes, two distal ones forming symmetrical condyles. The spinous processes are never connected. The others are dissymmetrical and two or three in number. The very concave internal face bears tuberosites. The zoarium is conical, very thick, higher than wide. These characteristics differentiate this species from Cupularia multispinata, Cupularia denticulata and Cupularia reussina.

Zooecia - Length 0.30 mm.
Width 0.20-0.26 mm.

Occurrences: Lower Miocene (Heterostegina zone): Syperior Oil Producing Co., Hernandez No. 1 well, Sec. 34, T. 8S., R. 3E., Acadia Parish, 7950 feet. Miocene ?: Terrebonne Gas Co., Fee No. 1, 2300 feet, Terrebonne Parish.

Morphotype: Louisiana State University Museum Collection No. 1324.

Discoporella umbellata Defrance

Plate 1, figures 4, 7, 9-11.

Lunulites umbellata Defrance, Dictionnaire du Sciences Naturelles, vol. 27, p. 361, 1823.

Cupularia umbellata Canu and Bassler, U. S. Nat. Mus. Bull. 125, p. 80, pl. 2, figs. 15-19, 1923. (For synonomy see the last reference given above).

The pictured specimen is identical with the ones pictured by Canu and Bassler. The spinous processes number from seven to eight, and are connected on the greater part of their length. However, some of the specimens observed were weathered and the processes were not connected.

Occurrence: Miocene ?: Terrebonne Gas Co., Fee No. 1, 2300 feet, Terrebonne Parish. Lower Miocene:(Heterostegina zone): Superior Oil Producing Company, Hernandez No. 1 well, Sec. 34, T. 8S., R. 3E., Acadia Parish, 8210 feet; Superior Oil Producing Company, Duplantier No. 1, Sec. 65, T. 7S., R. 1W., East Baton Rouge Parish, 7687-7707 feet.

Morphotype: Louisiana State University Museum Collection No. 1325.

Family Thalamoporellidae Levinsen, 1909

Genus Thalamoporella Hincks, 1887

Thalamoporella biperforata Canu and Bassler

Plate 2, figures 2, 6.

Thalamoporella biperforata Canu and Bassler, Geology and Paleontology of the West Indies, Bryozoa, Publication Carnegie Institution of Washington, No. 291, p. 88, pl. 6, figs. 10-15, 1919.

Thalamoporella biperforata Canu and Bassler, U. S. Nat. Mus. Bull. 125, p. 62, pl. 6, figs. 10-10, 1923.

> The zoarium is bilamellar. The zooecia are elongate, distinct, rectangular; the mural rim is thin, salient, bevelled, and bears two hollow tubercles on each side of the aperture. The cryptocyst is deep, flat, ornamented with large widely spaced pores and with numerous small pores closely placed together; the opesiules are very large, far distant from the aperture, placed symmetrically, but very unequal in size. The aperture is transverse, oval; the proximal border is always concave and the polypidian tube is limited by two small lateral denticles serving as pivot to the corneous mandible.

Occurrence: Lower Miocene (Heterostegina zone): Superior Oil Producing Company, Duplantier No. 1, Sec. 65, T. 7S., R. 1W., 7671-87 feet. Miocene ?: Terrebonne Gas Co., Fee No. 1, Terrebonne Parish, 2300 feet.

Morphotype: Louisiana State University Museum Collection No. 1328.

Thalamoporella sp.

Plate 7, figure 11.

From the fragment found, the zoarium appears to be unilamellar. The zooecia are long, narrow, distinct. The mural rim is thin, prominent. The cryptocyst is minutely perforated, granulated, bearing two large opesiules just below the oval aperture.

Zooecia - Length 0.70 mm.
Width 0.28 mm.

The only fragment found, Vicksburg locality, Rosefield, appears to be distinctive. However, no attempt is made to establish a new species.

Figured specimen No. 1329, Louisiana State University Museum Collection.

Division 4. Cellularina Smitt, 1867

Family Farciminariidae Busk, 1884

Genus Nellia Busk, 1853

Nellia oculata Busk

Plate 2, figures 5.

Nellia oculata Busk, Catalogue Marine Polyzoa, British Museum Pt. 1, Cheilostomata, p. 18, pl. 64, fig. 6, pl. 65, fig. 4, 1852.

Nellia oculata Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 196, pl. 82, figs. 6-10, 1920.

Nellia oculata Canu and Bassler, U. S. Nat. Mus. Bull. 125, p. 55, pl. 2, figs. 5-7, 1923. (For further references see Canu and Bassler).

The pictured specimen is a segment formed of four zooecia situated at right angles. The four faces of the zoarium are identical. The zooecia are distinct and vary slightly in size. The two frontal avicularia are simple. No ovicells were observed.

The zooecia are 0.50-0.65 mm. long and 0.20 mm. wide. The opesia are 0.30-0.50 mm. long.

This species occurs from the Jackson to the Recent.

Occurrences: Jackson: Tullos (rare); Moody's Branch Marl, Sabine Parish (very rare). Vicksburg: Rosefield, Louisiana (rare). Miocene: Wells in south Louisiana.

Morphotype: Louisiana State University Museum Collection No. 1332.

Nellia sp.

Plate 7, figure 13.

The fragment of a segment of this species exhibited well developed and projecting avicularia placed between the zooecia. The zooecium is shallow in the middle and deep on the ends giving the specimen a peculiar appearance.

The zooecia average 0.40 mm. in length and 0.22 mm. in width.

Specimen No. 1333, Louisiana State University Museum Collection, from Rosefield, Louisiana.

Suborder Ascophora Levinsen, 1909

Division 1. Cribrimorpha

Family Cribrilinidae Hincks, 1880

Genus Cribrilina Gray, 1848

Cribrilina miocenica McGuirt, n. sp.

Plate 2, figures 10-11.

The incrusting zoarium has distinct zooecia with a groove surrounding the proximal portion. The zooecia are raised and flat with the frontal perforated by 3-5 round and lunulate pores. On the majority of the zooecia these pores are 3 in number. The dietellae are numerous but irregular. The aperture consists of a straight anterior and a concave posterior. The large avicularia are usually placed between the zooecia, opposite the aperture. However, some were noted considerably below the aperture.

The only specimen observed is pictured. It was found in a core at 7,989 feet from the Superior Oil Producing Company's Hernandez No. 1 well, Sec. 34, T. 8S., R. 3E., Bosco Field.

Holotype: Louisiana State University Museum Collection No. 1336.

Genus Puellina Jullien, 1886

Puellina rosefieldensis McGuirt, n. sp.

Plate 7, figures 7, 9.

The zoarium is incrusting. The zooecia are oval, broad, slightly convex. The frontal of the zooecium is convex, ornamented with small, radial costules. The semi-circular aperture possesses a distinct spine on either side and in some instances other indefinite spines. The ovicell is large, smooth, globular. The avicularium has a very long canal.

The interzooecial avicularia and the zooecia are approximately 0.40 mm. in length.

The smooth globula ovicell, extremely long avicularium, and the spines make this species distinctive.

Holotype: Louisiana State University Museum Collection No. 1340, from Rosefield, Louisiana.

Puellina radiata Moll var. carolinensis Gabb and Horn

Plate 9, figure 2.

Puellina carolinensis Gabb and Horn, Jour. of the Academy of Natural Sciences of Philadelphia, vol. 5, p. 136, pl. 19, fig. 18, 1862.

Puellina radiata carolinensis Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 297, pl. 41, fig. 20, 1920.

Original description:

> Colony composed of a single layer of very small cellules, irregularly grouped, occasionally, though rarely, in quincunx, and not in longitudinal lines. Cellules convex, broadly oval, sometimes distorted so as to be twice as long as wide, or with one side nearly straight or angular.. Mouth terminal, varying from circular to transversely oval, bordered by a slightly raised lip of uniform thickness, with the proximal edge occasionally merging into the surface of the cellule. Behind the mouth are from five to seven pairs of fossets radiating from one point, placed at the bases of deep rounded excavations, opposite each other and at times crossing the whole surface of the cellule so as to unite. Sometimes there is an odd terminal fosset. We could detect no other ornaments on the surface.

The small zooecia, thick and smooth peristome, and 16 costules are characteristic of the specimen found encrusting Kleidionella grandis at Rosefield, Louisiana. Avicularia with the small or large distal canals are present on this specimen.

Morphotype: No. 1341, Louisiana State University Museum Collection.

Division 2. Typical Ascophora

Family Hippothoidae Levinsen, 1909

Genus Trypostega Levinsen, 1909

Trypostega venusta Norman, 1894

Plate 18, figures 5, 8.

Mollia tuberculata D'Orbigny, Paleontologie Francaise, Discription des Animaux invertebres, Terrain cretace, vol. 5, Bryozoaives, p. 388, not figured, 1851.

Trypostega venusta Canu and Bassler, U. S. Nat. Mus. Bull. 106, pp. 332-333, pl. 85, figs. 15, 16, 1920. (For additional references see Canu and Bassler).

The large frontal perforations of the incrusting zoarium,, circular rimule, and variable zooeciules are characteristic of the species.

The zooecia pictured have an average length of 0.45 mm.

It should be noted that Canu and Bassler did not observe this species below the Vicksburg.

Occurrence: Lower Jackson: Montgomery (rare); Tullos (very rare); and Gibson Landing (very rare). Vicksburg: Rosefield (very rare).

Morphotypes: Louisiana State University Museum Collection No. 1345.

Family Gigantoporidae Bassler, 1934

Genus Gigantopora Jullien, 1903

Gigantopora grandviewensis McGuirt, n. sp.

Plate 18, figures 7, 10.

The zoarium is bilamellar and separable. The zooecia are long and distinct with a frontal of small scattered pores. The peristome is raised, possessing the spiramen and avicularia. Deep in the peristomie is situated the round aperture. The narrow avicularia, on either one side or the other of the oval spiramen, points toward the round peristomice.

Length of zooecia - 0.60 mm. (average).

Width of zooecia - 0.25 mm. (average).

The only specimen found was collected at Grandview Bluff, Louisiana.

Holotype: No. 1348, Louisiana State University Museum Collection.

Family Stomachetosellidae Canu and Bassler, 1917

Genus Ochetosella Canu and Bassler, 1917

Ochetosella jacksonica Canu and Bassler

Plate 18, figures 9, 11.

Plate 19, figures 1-4.

Ochetosella jacksonica Canu and Bassler, U. S. Nat. Mus. Bull. 96, p. 50, pl. 5, fig. 3, 1917.

Ochetosella jacksonica Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 452, pl. 15, figs. 1-10, 1920.

> The zoarium is free, erect, cylindrical, bifurcated, often anastemosing. The zooecia are elongated, distinct, hexagonal, separated by a salient thread; the frontal is concave, bordered by large areolae, formed of a thin olocyst and covered by a unifrom and finely granulated pleurocyst. The apertura is semilunar and invisible externally; the peristomice is very oblique, with undefined outlines, vaguely triangular. The ovicell is globular and deeply embedded in the distal zooecia. The oral avicularium is rare.

The zooecia have an average length of 1.00 mm. and a width of 0.45 mm.

The variations of the species show the frontal of the zooecia smooth and convex with numerous small areolae. The lips around the aperture and the avicularium are well developed in the young specimens.

This species differs from Ochetosella robusta in its smaller zoarium and its large lateral areolae.

Occurrence: Lower Jackson: Montgomery, Louisiana (common); Heison Bluff, Ouachita River, Louisiana (common); Tullos (common); Bunker Hill (rare); and Heison Landing.

Morphotype: Louisiana State University Museum Collection No. 1351.

Ochetosella canui McGuirt, n. sp.

Plate 19, figures 5, 7.

The zoarium is incrusting. The zooecia are elongate, surrounded by a row of areolae. The convex frontal is smooth. The deep aperture is usually round. The peristome is thick and somewhat elevated.

The hyperstomal ovicells observed were broken, but appear to open into the peristomie.

The zooecia vary from 0.45 mm. to 0.70 mm. in length and from 0.25-0.40 mm. in width.

This species is named in honor of the late Ferdinand Canu.

The species occurs rarely at Montgomery, Louisiana.

Cotypes: Louisiana State University Museum Collection No. 1352.

Genus Enoplostomella Canu and Bassler, 1917

Enoplostomella magniporosa Canu and Bassler

Plate 8, figures 3, 5.

Enoplostomella magniporosa Canu and Bassler, U. S. Nat. Mus. Bull. No. 106, p. 439, pl. 89, figs. 15-20, 1920.

> The zoarium is free, bifurcated, compressed, formed of four longitudinal rows of zooecia arranged on one side only; on the dorsal face the zooecia are separated by projections and ornamented with large tremopores. The zooecia are distinct, elongated, hexagonal; the frontal is flat or convex and formed of a tremocyst with very large pores. The apertura is suborbicular; the peristomice is elongated and is provided with a wide and rounded rimule-spiramen. The ovicell is hyperstomial, small, salient, ornamented with tremopores. The avicularium is placed almost within the peristomie; it is oval, provided with a pivot; the beak is directed outward.

The figured specimen has dimensions somewhat smaller than the measurements of the cotypes of Canu and Bassler, but the remaining characters seem to be identical.

Morphotype: Louisiana State University Museum Collection No. 1355, from Rosefield, Louisiana.

Enoplostomella russelli McGuirt, n. sp.

Plate 8, figures 6, 12.

The zoarium is free and cylindrical. The zooecia are very distinct, large and elongate; separated by a thick and high ridge. The frontal pores of the zooecium are numerous, varying in size. The peristome is highly developed on each side of the aperture. The avicularia placed near the peristomice are long and provided with a pivot. The beak of the avicularia is turned outward.

The zooecia are approximately 0.80 mm. in length and 0.50 mm. in width. The avicularia average 0.33 mm. in length.

The enlarged condition of the avicularium and the peristomice are the distinguishing features.

Occurrence: Rosefield (very rare).

Holotype: Louisiana State University Museum Collection No. 1356.

Genus Metradolium Canu and Bassler, 1917

Metradolium sp.

Plate 19, figures 6, 9-13.

The analytical key to the species of Metradolium as given by Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 448, 1920, is based on the presence or absence of the spiramen. Their figures of the different species show that the spiramen and rimule may be present in each case.

Several specimens of this species were examined by the author from Tullos, Louisiana. On the same specimen the rimule and spiramen have been observed. There is one large avicularium that may be on either side of the spiramen or rimule. None of the specimens exhibited two avicularia near the rimule-spiramen. More material will have to be examined before establishing the species.

The length of the zooecia varies from 0.70 mm. to 1.00 mm.

Specimen No. 1360, Louisiana State University Museum Collection.

Genus Metrocrypta Canu and Bassler, 1917

Metrocrypta rosefieldensis McGuirt, n. sp.

Plate 8, figures 1-3, 4.

The zoarium is cylindrical. The zooecia are large and distinct, with a convex frontal containing large tremopores. The long, high peristome possesses one or two small and irregular avicularia. The aperture is small and oblique to the peristomice. The rimule-spiramen is conspicuous.

The zooecia have an average length of 0.95 mm. and a width of 0.60 mm.

The species occurs rarely at Rosefield, Louisiana.

Holotype: Louisiana State University Museum Collection No. 1364.

Family Schizoporellidae Bassler, 1934

Genus Dakaria Jullien, 1903

Dakaria sp.

Plate 2, figures 3, 7.

The pictured specimens occurred at a depth of 7687-7707 feet in the Superior Oil Company's Duplantier No. 1 well, East Baton Rouge Parish. The large incrusting zooecia possess a granular and minutely perforated tremocyst. The aperture is large, round. No ovicells or avicularia are present on the observed specimens.

Specimen No. 1367, Louisiana State University Museum Collection.

Genus Schizoporella Hincks, 1877

Schizoporella sp.

Plate 20, figure 1.

The zoarium incrusts a shell. The oriented zooecia are long, distinct, oval. The frontal is convex, perforated by numerous small pores. There is one small oval avicularium on one or both sides of the oval aperture. The aperture is 0.16 mm. long and 0.12 mm. wide. In the aperture two small symmetrical cardelles are placed low separating the larger distal from the slightly constricted proximal.

The zooecia average 0.70 mm. in length and 0.45 mm. in width.

No ovicells were present on the only specimen observed.

Specimen No. 1370, Louisiana State University Museum Collection, from Stock Landing.

Genus Bactridium Reuss, 1848

Bactridium heisonensis McGuirt, n. sp.

Plate 20, figures 2-5.

The zoarium is cyclindrical, formed of four rows of longitudinal zooecia. The zooecia are arranged in groups of four. Two are back to back with the other two added on opposite sides and at right angles. The zooecia are distinct, longer than wide. The frontal of the zooecium is very convex and perforated by numerous pores. The aperture is oval, and contains two small cardelles. The peristome has two lateral and a distal projection. On one side of the aperture an avicularium is in some instances present. The convex, porous, large ovicell has an orifice opening above the aperture.

The zooecia are 0.68-0.82 mm. in length.

The manner of growth of the zoarium characterizes this species.

Occurrence: Bunker Hill, Grandview Bluff, Gibson Landing, Montgomery (rare), and Heison Bluff (common).

Cotypes: Louisiana State University Museum Collection No. 1373.

Genus Hippomenella Canu and Bassler, 1917

Hippomenella fiski McGuirt, n. sp.

Plate 20, figures 6, 9.

The zoarium is incrusting, fragile. The zooecia are smooth, convex; surrounded by two rows of areolae. The aperture is elliptical, contains two cardelles and a distinct lyrula. There are several spines surrounding the aperture. The ovicell is very globular, finely perforated, slightly embedded in the distal zooecia. The avicularia are prominent, placed symmetrically below and on each side of the aperture, and directed transverse to the length of the zooecia. They usually have a pivot.

Measurements on the single specimen found at Montgomery:

Length of zooecia - 0.40 mm. (average)

Width of zooecia - 0.30 mm. (average)

Avicularia (maximum length) - 0.30 mm.

This species is named in honor Dr. H. N. Fisk, Geology Department, Louisiana State University, for his aid in collecting material for study.

Holotype: Louisiana State University Museum Collection No. 1375.

Hippomenella transversora Canu and Bassler

Plate 21, figures 1-2.

Hippomenella transversora Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 388, pl. 86, figs. 20-24, 1920.

The one fragment of the unilamellar zoarium observed possessed the transverse aperture with a conspicuous mucro and two rows of triangular areolae of this species. No avicularia or ovicells are present on the specimen, but the zoarium is apparently distinctive.

The zooecia have an average length of 0.43 mm.

Morphotype: Louisiana State University Collection No. 1376, from Bunker Hill, La.

Hippomenella incondita Canu and Bassler

Plate 20, figures 7-8, 10-12.

Hippomenella incondita Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 383, pl. 50, figs. 1-8, 1920.

> The zoarium is free, formed of two lamellae, back to back, and inseparable; the fronds are wide, irregular, and undulated. The zooecia are distinct, somewhat elongated, elliptical, swollen; the frontal is convex and garnished laterally with a double row of large areolae. The aperture is exteriorly semilunar; the proximal border has a very convex mucronoid protuberance. The ovicell is hyperstomial, salient, much imbedded in the distal zooecia, never closed by the operculum, very irregularly punctate. The avicularia are placed laterally on the line of the areolae, close to and somewhat below the aperture; they are small, little prominent, and their beak is directed downward. No spines.

The zooecia are 0.80-1.20 mm. long, and 0.20-0.40 mm. wide.

The micro-measurements above are more variable than Canu and Bassler allowed for the species. Spines are present on the pictured specimens. In addition to the two rows of areolae there are several scattered on the center of frontal.

The semilunar aperture, perforations on the ovicell, and the long and narrow zooecia are characteristic of this species.

Morphotype: Louisiana State University Museum Collection No. 1377, from Bunker Hill, Louisiana.

Hippomenella rotula Canu and Bassler

Plate 21, figures 4, 5, 7, 9.

Hippomenella rotula U. S. Nat. Mus. Bull. 106, p. 381, pl. 49, figs. 4-14, 1920.

> The zoarium is free, formed by two lamellae, back to back, and inseparable. The fronds are flat or undulating and may measure 2 cm. in length. The zooecia are distinct, very elongated, fusiform; the frontal, little convex and smooth, is garnished laterally with a double row of areolae much crowded. The aperture is elliptical (in the interior); it presents exteriorly a mucronoid convexity very salient on its proximal border; there are two very small cardelles. The ovicell is large, globular, salient, much embedded in the distal zooecia; the two lateral areas bear three or four large cavities separated by radial projections. The avicularia are small, inconstant, placed laterally below the aperture, provided with a pivot, and with a triangular beak directed toward the base. No spines.

The avicularia on the specimens observed by the writer are larger, single in number, and usually nearer the center of the frontal than those pictured by Canu and Bassler. There are usually one or two pores near the avicularia in addition to the two rows of areolae.

The zooecia pictured are from 0.85-1.30 mm. long, and 0.30-0.50 mm. wide.

The particular manner in which the ovicells are perforated and the avicularium are characteristics of this species.

Specimens were found in the Lower Jackson at Montgomery, Tullos, and Heison Bluff, Louisiana.

Morphotype: Louisiana State University Museum Collection No. 1378.

Hippomenella radicata Canu and Bassler

Plate 21, figures 3, 6.

Hippomenella radicata, U. S. Nat. Mus. Bull. No. 106, p. 387, pl. 50, figs. 19-24, 1920.

> The zoarium is unilamellar and creeps over algae; the lower face presents some elongated zooecia, smooth or striated transversally and regularly perforated by a radicular (?) pore. The zooecia are elongated, distinct, oval, separated by a furrow. The frontal is smooth, convex, garnished laterally by a double row of triangular areolae often separated by short pleurocystal costules. The aperture is elongated, elliptical, provided with two very small cardelles; it is surrounded by a peristome little salient, garnished with 6 large spines; there is a vestibular arch. The ovicell is globular, salient, hyperstomial, embedded in the distal zooecia, never closed by the operculum; the two areas are smooth or punctate. The avicularia are placed below the aperture; they are salient, triangular, the beak pointed toward the bottom, rarely symmetrical.

The average length of the zooecia on the two specimens observed is 0.70 mm. and the average width 0.50 mm.

The specimens show four to six spines around the aperture. The zooecia are very distinct, their frontal raised.

Unfortunately the fragments, found only at Tullos, do not have a complete ovicell. The consistent radicular pore on the under side and the raised avicularia that point downward are characteristic.

Morphotype: Louisiana State University Museum Collection No. 1379.

Family Smittinidae Levinsen, 1909

Genus Smittina Norman, 1903

Smittina angulata Reuss

Plate 21, figures 8, 10-12.

Cumulipora angulata Reuss, Die Foraminiferen, Anthozoen und Bryozoen des deutschen Septarienthones, Denkschriften der Academie der Wissenschaften, Wien, vol. 25, Abth. 1, pl. 8, fig. 12, 1865.

Smittina angulata Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 461, pl. 60, figs. 1-16, 1920.

> The zoarium is large, massive, irregular, with lobed branches, multilamellar, hollow; it incrusts large algae or shells. The zooecia (in the more common form) are elongated, distinct, claviform; the frontal is convex, bordered by a line of round or triangular areolae; it is formed of a smooth olocyst, perforated laterally, supporting a porous pleurocyst. The apertura is semilunar with a convex proximal border; the peristomice is semilunar; the peristome is little salient; there is no lyrula. The ovicell is rare, placed on the distal zooecia, somewhat convex, completely surrounding the apertura, of the same nature as the frontal area. The median avicularium is peristomial and little elliptical, with pivot. On the line of the areolae there is another small elliptical avicularium, with pivot.

The length of the zooecia varies on observed specimens from 0,50-0.90 mm.

The specimens examined display all the characteristics of Smittina angulata Canu and Bassler, except they have a small lyrula, and a minutely perforated olocyst as seen under a magnification of thirty times or more. The pleurocyst has many pores.

Occurrence: Lower Jackson: Montgomery and Tullos (rare).

Morphotype: Louisiana State University Museum Collection No. 1383.

Smittina sp.

Plate 8, figures 7, 10.

The only fragment of the species found is pictured. The frontal is almost flat, possesses a row of areolae, a median avicularia and an incomplete ovicell. In the interior the smooth olocyst and lateral areolae are visible.

The fragment seems to be identical with S. reticulata McGillivray, 1882.

Specimen No. 1384, from Rosefield, Louisiana, has zooecia with an average length of 0.45 mm.

Smittina rosefieldensis McGuirt, n. sp.

Plate 8, figures 8-9, 11.

The zoarium is cylindrical, consisting of four or five rows of zooecia. The convex frontal is smooth or granulated, surrounded by a single row of large sub-oval areolae; the pleurocyst is easily removed. The peristome of the younger and better preserved specimens is greatly developed, and is very thick on the older specimens. The median avicularia are irregular in shape and size, and often absent. The lateral areolae, smooth ooecyst, and two small cardelles are visible in the interior.

The diameter of the zoaria varies from 0.5-0.9 mm.

This species is abundant in the lower part of the section at Rosefield, La.

Cotype: No. 1385, Louisiana State University Museum Collection.

Genus Porella Gray, 1848

Porella montgomeryensis McGuirt, n. sp.

Plate 22, figures 3, 5.

The zoarium incrusts Porella jacksonica. The zooecia are distinct, irregular. They have a convex frontal formed of a tremocyst of numerous small pores. The oval apertura is partially hidden by the well developed peristome. The hyperstomial globular ovicell is perforated by pores that are smaller than those of the frontal of the zooecia. The ovicell opens into the peristomie immediately above the aperature. In addition to a large, median avicularium, there are 1 or 2 conspicuous, irregular, small, adventitious avicularia.

The average length of the zooecium is 0.45 mm.

The presence of the one median avicularium and 1 or 2 adventitious avicularia separates this species from Porella irregularis and Porella coronata, Canu and Bassler, 1920.

Cotypes: Louisiana State University Museum Collection No. 1390, from Montgomery, Louisiana.

Porella ouachitaensis McGuirt, n. sp.

Plate 23, figures 7, 10-11.

The zoarium is incrusting, very fragile. The zooecia are somewhat regular in position, small. Some of the zooecia are more elongated than others. The frontal is slightly convex, the tremocyst perforated by numerous small pores. The apertura as seen from the interior is oval and has a well developed lyrula projecting into it. The peristome is thin, elevated. The rimule that is so well developed on the exterior is not visible from the interior as it is hidden by the lyrula. The elongate avicularium is placed near the rimule below. It is furnished with a pivot. The globular ovicell is partially imbedded in the distal zooecia, finely perforated, conspicuous.

The zooecia are 0.40-0.55 mm. long and 0.18-0.32 mm. wide. The avicularia have a length of approximately 0.1 mm.

The species occurs rarely at Bunker Hill.

Cotype: No. 1391, Louisiana State University Museum Collection.

Porella coronata Canu and Bassler, var.
moodysbranchensis McGuirt, n. var.
Plate 23, figures 6, 8-9, 12.

This variety differs from P. coronata in having smaller zoöecial dimensions, less conspicuous peristome, and flatter zoöecia. The median avicularium is absent or very insignificant. From the interior two small cardelles may be observed.

The zoöecia have an average length of 0.45 mm. and a width of 0.28 mm.

The ovicell, avicularium on the peristome, and adventitious avicularia may be seen on the specimens pictured.

The variety occurs rarely at Montgomery, Louisiana.

Cotype: No. 1392, Louisiana State University Museum Collection.

Porella compacta Canu and Bassler

Plate 3, figures 3, 5.

Porella compacta Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 492, pl. 94, figs. 12, 13, 1920.

> The zoarium is free, bilamellar, formed of two lamellae, back to back, and easily separable; the fronds are very narrow and bifurcated. The zooecia are distinct, somewhat elongated, wide; the frontal is convex and formed of a tremocyst with tubules coalesced into very large tremopores, placed on an olocyst with numerous small pores. The apertura (interior) is elongated, semilunar, oblique; it has no salient peristome. The ovicell is very small, not salient, ornamented also with large tremopores. The avicularium forms an enormous umbo, large, short, thickset, oblique, hiding a part of the apertura, costulated longitudinally.

Only one specimen observed was found in a core from a depth of 8210 feet in the Superior Oil Producing Company's Hernandez No. 1 well, Sec. 34, T. 8S., R. 3E., Acadia Parish.

Morphotype: Louisiana State University Museum Collection No. 1393.

Porella denticulifera Canu and Bassler

Plate 22, figures 1-2, 4, 6-11.

Plate 23, figures 1-2.

Porella denticulifera Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 485, pl. 63, figs. 1-5, 1920.

> The zoarium is bilamellar; the two lamellae are back to back and separable. The zooecia are indistinct; the frontal is little convex and formed of a tremocyst, with pores enormous and little numerous. The apertura (in the interior) is semicircular and quite oblique with a proximal border somewhat concave; the peristomice has the form of a trapezoid; the peristome is absent. The ovicell is small, entirely embedded in the distal zooecium, not salient; its frontal is perforated with numerous small pores. The median avicularium is rather large, smooth; it makes a prominence in the peristomie in the form of a denticulated tube with its distal part.

The zooecia have an approximate length of 0.7 mm.

This species was separated by Canu and Bassler from P. jacksonica on the larger size of the tremopores. This feature, however, appears to be extremely variable within the same specimen.

Variations in the size of the avicularia from 0.05 mm. to 0.15 mm. gives to some of the specimens a very peculiar appearance.

Fragments were observed in the material from Montgomery, Tullos, Stock Landing, Heison Bluff, and Bunker Hill.

Morphotype: Louisiana State University Musuem Collection No. 1394.

Porella jacksonica Canu and Bassler

Plate 23, figures 3-5.

Porella jacksonica Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 486, pl. 63, figs. 6-17, 1920.

> The zoarium is bilamellar, formed of two lamellae, back to back, difficultly separable; the fronds are flat or undulated. The zooecia are distinct, very elongated, fusiform; the frontal is convex and terminated distally by an enormous, oblique avicularium mucro making a projection at 45 degrees and covering in part the apertura; the frontal is formed by a tremocyst with large tubular pores resting on a thin perforated olocyst. The apertura is transverse, semilunar, oblique, buried at the base of the peristomie. The peristome is not salient. The ovicell is entirely imbedded in the walls of the distal zooecia and is not salient; its frontal area is pierced with pores and very fragile. The median avicularium is smooth, enormous, very salient; it opens on the side of the apertura. There are some small, inconstant avicularia formed by the coalesence of two tremopores.

The zooecia are from 0.60 mm. to 0.85 mm. long on the observed specimens.

Canu and Bassler state the median avicularium opens on the side of the apertura. The figures accompanying the description do not bear this out. Further study may show P. denticulifera to be a variety of this species.

Occurrence: Lower Jackson: Montgomery (common); Tullos (very rare).

Morphotype: Louisiana State University Museum Collection No. 1395.

Family Tubucellariidae Busk, 1884

Genus Tubucellaria D'Orbigny, 1852

Tubucellaria sp. A

Plate 3, figures 2, 6-7.

The cylindrical zoaria are short and have an average width of 0.8 mm. There are six longitudinal rows of zooecia. The convex frontal of the long zooecium is perforated by numerous pores. The ascopore occupies the greatest convexity on the frontal located approximately 0.2 mm. below the peristomice. The small peristomice is usually closed.

The zooecia have a length of 1.05-1.15 mm.

Occurrence: Miocene (Heterostegina zone): Superior's Hernandez No. 1 well, 8,543 feet, Sec. 34, T. 8S., R. 3E., Acadia Parish; Superior's Duplantier No. 1, 8,001 feet, Sec. 65, T. 7S., R. 1W., East Baton Rouge Parish.

Specimen No. 1399, Louisiana State University Museum Collection.

Tubucellaria sp. B

Plate 3, figures 1, 4.

The single fragment observed is cylindrical, short. It is composed of eight rows of zooecia. The zooecia are long, narrowed posteriorly. The frontal is convex and minutely perforated. The small ascopore is less than 0.1 mm. below the large peristomice.

Diameter of peristomice - 0.15 mm.

Length of zooecia - 1.30 mm.

Occurrence: Miocene (Heterostegina zone): Superior's Hernandez No. 1 well, 8,543 feet, Sec. 34, T. 8S., R. 3E., Acadia Parish.

Specimen No. 1400, Louisiana State University Museum Collection.

Family Reteporidae Smitt, 1867

Genus Retepora Imperato, 1599

Retepora doverensis Ulrich and Bassler

Plate 3, figures 8, 10-11.

Retepora doverensis Ulrich and Bassler, Maryland Geol. Survey, Miocene, p. 422,pl. 111, figs. 5-7; pl. 115, figs. 1-5, 1904.

Retepora doverensis Canu and Bassler, U. S. Nat. Mus. Bull. No. 125, p. 152, pl. 23, figs. 11-17, 1923.

The variations of the specimens that appear to be identical with this species are pictured. On the frontal of the reticulate zoarium the large avicularium, fissured ovicells, few scattered pores, small peristomice, and rimule may be observed.

The species occurs commonly at depths of 8,001 and 8,543 feet in the Superior Oil Company's Duplantier No. 1 well, Sec. 65, T. 7S., R. 1W., East Baton Rouge Parish; Hernandez No. 1 well, Sec. 34, T. 8S., R. 3E., Acadia Parish, respectively.

Morphotypes: Louisiana State University Museum Collection No. 1404.

Family Adeonidae Jullien, 1903

Genus Adeonellopsis MacGillivray, 1886

Adeonellopsis transversa Canu and Bassler

Plate 24, figures 1-5.

Adeonellopsis transversa Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 566, pl. 15, figs. 11-19, 1920.

> The zoarium is free and bilamellar, the two lamellae being separable. The ordinary zooecia are elongated, little distinct, separated by a furrow, elliptical in the interior, and surrounded by a score of areolae. The peristomice is oval and elongated; the peristomie is shallow; it contains proximally a small avicularium almost transverse, and distally the aperture, which in the interior is semilunar with a slight convex proximal border. The stellate ascophore is placed on the median part of the zooecia close to the peristome. One of the areolae is transformed into a round, rather large, irregularly placed avicularium, giving to the zooecia a strange and undefinable aspect. The gonoecia are larger than the ordinary zooecia and bear ascopores (three) arranged in a triangle and placed in a cavity of the frontal.

The length of the zooecia varies from 0.30 mm. to 0.50 mm.

A number of specimens have been examined and grouped under this species. Canu and Bassler, 1920, pointed out that A. quisenberryae differs from this species in having a uniporous exterior cribiform area and a multiporous interior cribiform area. The pictured specimens exhibit from one to four pores in the interior, but only one on the exterior. On these same specimens, however, the zooecia are consistently smaller than A. quisenberryae. The position and size of the adventitious avicularia are irregular.

Occurrence: Claiborne (Cook Mountain): St. Maurice and

2.6 miles southeast of Arcadia. Lower Jackson: Montgomery (rare); Tullos; Grandview Bluff; Heison Bluff; and Bunker Hill (very rare). Upper Jackson: Danville Landing, Ouachita River, Louisiana.

Morphotype: Louisiana State University Museum Collection No. 1408;

Adeonellopsis cyclops Canu and Bassler

Plate 10, figures 1-3.

Adeonellopsis cyclops Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 570, pl. 100, figs. 1-11, 1920.

> The zoarium is free, erect, bilamellar, formed of small dichotomously branching fronds; the two lamellae, placed back to back, are inseparable. The zooecia are distinct, elongated, elliptical, bordered by numerous parietal areolae. The marginal zooecia are very long, and without distal avicularia on the peristome or median avicularium and with a very small cribriform area. The median zooecia are wide; their cribriform area is large and of little depth, and the median avicularium is round and prominent. The peristomice is crescent shaped; the peristome thin and sharp, bears a small, round avicularium. The zooecia bear in their inferior part one or two small adventitious avicularia. The old zooecia have thick walls and their apertura, cribriform area and avicularia are arranged at the bottom of a total area.

The zooecia examined have an average length of 0.48 mm.

The cribriform area, median avicularium, and rare distal peristomial avicularium are characteristic. The cribriform area is perforated by numerous small pores. The peristomial avicularium as shown on the figures of Canu and Bassler is present on the marginal zooecia. The lamellae may be separated with difficulty.

Morphotype: Louisiana State University Museum Collection No. 1409, from Rosefield, Louisiana.

Adeonellopsis sp. A

Plate 24, figures 7-8.

The two narrow specimens of this species observed from Montgomery are pictured. The irregular, perforated, rather smooth, convex frontal is peculiar. The peristome is raised and has a symmetrical peristomial avicularium. The semi-circular aperture is moderately deep.

The median zooecia average 0.50 mm. in length and the marginal 0.60 mm.

The author is of the opinion that the pictured specimens are the young of a distinct species, but hesitates to place them without further study. The specimens resemble A. cyclops of the Oligocene in having marginal zooecia distinctly different from the median ones.

Louisiana State University Museum Collection No. 1410.

Adeonellopsis sp. B

Plate 24, figures 6, 9.

The figured bilamellar fronds occur rarely at Montgomery. The zooecia possess numerous variations. They may be closed; possess a simple, small, single or double ascopore on the exterior as well as in the interior; a deep ascopore perforated in the interior by three pores. The zooecia are surrounded by minute areolae. The adventitious avicularium is usually absent. The median avicularia are large, oblique to transverse.

The dimensions are more constant, having a length of 0.50 mm. for the median zooecia and 0.60 mm. for the marginal ones.

The majority of variations exhibited by A. transversa and A. quisenberryae may be observed on two or three specimens of this species.

Specimen No. 1411, Louisiana State University Museum Collection.

Adeonellopsis cf. A. galeata Canu and Bassler

Plate 10, figures 4-5, 9.

Adeonellopsis galeata Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 568, pl. 99, figs. 1-10, 1920.

The two specimens collected from Rosefield, Louisiana, and compared to this species are old. The deep median avicularium is preserved on a few zooecia. The avicularium at the base of the zooecium is the only one visible on the greater part of the zoarium.

The zooecia have an average length of 0.40 mm., which is smaller than A. cyclops.

Specimen No. 1412, Louisiana State University Museum Collection.

Adeonellopsis grandis Canu and Bassler

Plate 10, figures 6-7, 11.

Adeonellopsis grandis Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 568, pl. 99, figs. 11-18, 1920.

The zoarial dimensions of the branching specimens found seem to justify placing them under this species. A calcareous deposit covers the external characters, in some cases obliterating even the aviculariun. The cribriform area of A. cyclops was not observed.

Specimens were found rarely in the lower part of the section at Rosefield, Louisiana.

Morphotype: Louisiana State University Museum Collection No. 1413.

Genus Trigonopora Maplestone, 1902

Trigonopora sp.

Plate 4, figures 4, 11.

The zoarium is bilamellar, large. The zooecia have a slightly convex or flat frontal that is surrounded by a number of areolae. Ridges separate the zooecia. Neither avicularia nor ovicells have been observed.

The zooecia have an average length of 1.00 mm. and a width of approximately 0.25 mm.

The specimens resemble Metrarabdotos lacrymosum Canu and Bassler, 1919, in its narrow, rectangular fronds and long, straight zooecia.

Occurrence: Lower Miocene (Heterostegina zone): Superior Oil Producing Company, Hernandez No. 1 well, Sec. 34, T. 8 8S., R. 3E., Acadia Parish, 7991-99 feet.

Specimen No. 1417, Louisiana State University Museum Collection.

Trigonopora sp.

Plate 4, figures 7-8, 10.

The large areolae as seen from the interior, the lyrula, the size and position of the oral avicularia, and the dimensions of the zooecia may be observed in figures. No ovicells were observed. The fronds are slightly oval, large.

The dimensions of the zooecia vary in length from 0.60 to 0.75 mm., and in width from 0.25 to 0.35 mm.

The variations of the fragments are pictured.

Occurrence: Vicksburg: Rosefield (rare).

Morphotype: Louisiana State University Museum Collection No. 1418.

Trigonopora grande Canu and Bassler

Plate 10, figures 8, 10.

Metrarabdotos grande Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 537, pl. 98, figs. 11-15, 1920.

The specimens collected from Rosefield, Louisiana, differ only slightly from the description of the Marianna specimen studied by Canu and Bassler. The zooecia have a length of 0.75-0.85 mm. instead of 0.90 mm. In many instances the ovicells with deep intercostular spaces are replaced by shallow ones.

They resemble the pleisotypes in the apertural dimensions (0.10 mm. long and wide), wide compressed zoarium, absence of avicularia and finally the presence of small, inconstant lyrula.

Morphotype: Louisiana State University Museum Collection No. 1419.

Trigonopora colligatum Canu and Bassler,
var. catahoulana McGuirt, n. var.
Plate 3, figures 9, 12.
Plate 4, figures 1-2.

The zoarium is wide, flat, bilamellar. The convex zooecia are long, very distinct and surrounded by 18-21 large areolae. The peristome is raised. The oval peristomice has a conspicuous lyrula projecting into it at an oblique angle to the length of the zooecium. Two small, variable, oral avicularia are present. The ovicells observed were broken, but retained portions of the radiating costules.

Two small variable, oral avicularia are present. The ovicells observed were broken, but retained portions of the radiating costules.

Length of zooecia - 0.60-0.70 mm.
Width of zooecia - 0.28-0.30 mm.
Aperture - length - 0.12-0.14 mm.
width - 0.9-0.12 mm.

This variety differs from T. colligatum Canu and Bassler, the Bowden species, in its prominent lyrula and different dimensions.

Occurrence: Lower Miocene (Heterostegina zone): Superior Oil Producing Co., Hernandez No. 1 well, Sec. 34, T. 8S., R. 3E., Acadia Parish, 7995 feet.

Cotypes: Louisiana State University Museum Collection No. 1420.

Family Phylactellidae Canu and Bassler, 1917

Genus Perigastrella Canu and Bassler, 1917

Perigastrella elegans Canu and Bassler

Plate 24, figures 10-11.

Perigastrella elegans Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 579, pl. 73, fig. 1, 1920.

> The zoarium incrusts shells. The zooecia are distinct, a little elongated, small, elliptical; the frontal is convex and surrounded by two or three rows of round or triangular areolar pores; it is formed of a very finely granular pleurocyst. The apertura is deep, trapezoid; the peristome is complete, thin, salient; its inferior lip is a very salient mucro, hiding somewhat the apertura or depressed on the frontal. The ovicell is very small, little salient, and formed of a pleurocyst and an olocyst which are distinct from each other.

The zooecia have a length of 0.40-0.50 mm. and a width of 0.30-0.40 mm.

The two or three rows of areolae surrounding the zooecia, together with the length of the zooecia and the small, smooth ovicell are characteristic for the species. The peristome usually bears six spines when the ovicell is not present.

Occurrence: Montgomery, Louisiana (very rare).

Morphotype: Louisiana State University Museum Collection No. 1424.

Perigastrella oscitans Canu and Bassler

Plate 24, figure 12.

Plate 25, figures 1-2.

Perigastrella oscitans Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 578, pl. 72, figs. 15-18, 1920.

This distinctive species differs from P. elegans in its larger dimensions, more elevated and open ovicells, usually only one row of large triangular areolae, three denticles in the peristomie, and a more granular frontal on the zooecium. The peristome more often has six spines, but seven or eight are occasionally present.

The zooecia of the two specimens collected at Montgomery, Louisiana, are 0.60-0.65 mm. long and 0.35-0.46 mm. wide.

Morphotype No. 1425, Louisiana State University Museum Collection.

Perigastrella sp.

Plate 9, figure 1.

The zoarium is incrusting other bryozoa. The small, oval zooecia are erect. The frontal is smooth, surrounded by a few scattered areolae. The circular aperture is situated at the base of a deep peristomie. The peristome is thin.

The zooecia of the single specimen observed have a length of 0.20-0.35 mm.

Specimen No. 1426, Louisiana State University Museum Collection, from Rosefield, Louisiana.

Genus Phylactella Hincks, 1880

Phylactella parvicollum Canu and Bassler

Plate 25, figures 3, 5.

Phylactella parvicollum Canu and Bassler, U. S. Nat. Museum Bull. 106, p. 574, pl. 72, fig. 9, 1920.

> The zoarium incrusts shells. The zooecia are distinct, elongated, elliptical or oval; the frontal is convex and formed of a tremocyst with very small pores separated by small salient granulations. The apertura is orbicular; it is formed of a large anter separated by two small cardelles from a small concave and finely denticulated poster; the peristome is small, little salient, often interrupted distally by a small salient tongue.

The zooecia of the one specimen found average 0.60 mm. in length, and 0.44 mm. in width.

The granular and porous tremocyst, and the peristome with a distal tongue are distinctive.

Morphotype: Louisiana State University Museum Collection No. 1430, from Stock Landing, Louisiana (very rare).

Family Celleporidae Busk, 1852

Genus Holoporella Waters, 1909

Holoporella granulosa Canu and Bassler

Plate 25, figure 10.

Plate 26, figures 1-4, 7.

Holoporella granulosa Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 607, pl. 16, figs. 1-9, 1920.

> The zoarium is massive and formed of small globular masses fixed to bryozoa or to shells, which it surrounds completely. The superficial zooecia are little erect, oblique, large, elliptical; the frontal is convex, surrounded by widely spaced areolae and formed of a granular pleurocyst placed on the olocyst. The aperture is large, semilunar, with a concave, proximal border; the peristome bears laterally one to two lateral avicularia. The ovicell is hyperstomial, recumbent, transverse, small, somewhat salient, granular, widely open above the aperture. The deep zooecia have a normal aperture and a very salient, peristomial avicularium. The incomplete zooecia are rare. The interzooecial avicularia are rather large, oval, little salient, without pivot.

Occurrence: Claiborne (Cook Mountain formation): St. Maurice and 2.6 miles southeast of Arcadia (very common). Lower Jackson: Montgomery (rare); Heison Bluff, Grandview Bluff and Bunker Hill (very rare).

Morphotype: Louisiana State University Museum Collection No. 1433.

Holoporella cf. H. discus Canu and Bassler

Plate 11, figures 1, 3, 5-6, 9.

Holoporella discus Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 612, pl. 102, figs. 10-13, 1920.

The discoidal zoarium has erect zooecia surrounded by a few scattered areolae. Between the elevated zooecia there are deep ones with no frontal. The peristome is smooth with no spines or avicularia. The two condyles of the aperture are visible.

The aperture has a length of 0.12 mm. and a width of 0.14 mm.

The specimens pictured, devoid of a basal sub-stratum, are found rarely at Rosefield, Louisiana.

Morphotype: No. 1434, Louisiana State University Museum Collection.

Holoporella rosefieldensis McGuirt, n. sp.

Plate 11, figures 2, 4.

The zoarium is free, massive and flat. The superficial zooecia are erect and separated by narrow deep zooecia. Their frontal is surrounded by several large areolae. The subsquare aperture has two minute cardelles separating the large anterior from the small posterior. The smooth, thick peristome supports an inconstant avicularia. In the deep zooecia apertures that are smaller than those of the superficial zooecia, ovicells and avicularia are visible.

The aperture of the superficial zooecia averages 0.12 mm. in width and length.

The specimens pictured differ from H. seposita Canu and Bassler in the absence of spines and the presence of a large peristomial avicularium on the closely spaced zooecia.

A shorter peristomie and a larger avicularium differentiates this species from H. peristomaria Canu and Bassler.

Occurrence: Vicksburg: Rosefield, Louisiana (very rare).

Cotypes: Louisiana State University Museum Collection No. 1435.

Holoporella fissurata Canu and Bassler

Plate 26, figures 5, 8-10.

Plate 27, figures 1-3.

Holoporella fissurata Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 605, pl. 76, figs. 1-6, 1920.

The incrusting pictured specimens from Montgomery, Louisiana, are assigned to this species as they possess ovicells with fissures or cicatrix, deep zooecia, very conspicuous oral avicularia, and apertures that have a length and width of approximately 0.12 mm. Two spines are often present on the peristome.

The mucro is very prominent on the marginal and younger zooecia and partially hides the orifice of the zooecia. The oral avicularia possess bars.

Morphotype: No. 1436, Louisiana State University Museum Collection.

Holoporella sp. A

Plate 26, figures 6, 11.

The fragments of a zoarium observed are flat with the under side perforated by small scattered pores. The marginal and superificial zooecia are large, convex, smooth, and surrounded by several areolae. Often two symmetrical avicularia with pivots are present a little below and on each side of the aperture. One avicularium and the aperture are visible on the deep zooecia. The large aperture (0.13 mm. wide and long), has two cardelles near the slightly concave lower lip. The ovicell opens immediately above the aperture. The peristome possesses two spines.

Specimen No. 1437, Louisiana State University Museum Collection, occurs very rarely at Montgomery, Louisiana.

Holoporella montgomeryensis McGuirt, n. sp.

Plate 25, figures 4, 6-9, 11-12.

The free, massive zoarium is composed of cumulate zooecia. The superficial zooecia are distinct, oval, inconstant. The smooth frontal is surrounded by a few small, obscure areolae. One or two oval or elongate oral avicularia with a bar or condyles are present. The larger circular anterior portion of the aperture is separated from the smaller posterior by two symmetrical cardelles. The posterior lip of the aperture is slightly curved. The peristome is thick, smooth. In the deep zooecia an aperture, an avicularium, and a mucro are visible from the exterior. The large, pointed, interzooecial avicularia are situated between the deep and superficial zooecia. The ovicells are globular, smooth or fissured.

The interzooecial avicularia average 0.20 mm. in length.

The apertures average 0.10 mm. in width and length.

Cotypes: Louisiana State University Museum Collection No. 1438, from Montgomery, Louisiana.

Genus Osthimosia Jullien, 1888

Osthimosia glomerata Gabb and Horn

Plate 27, figures 4-6, 8.

Reptocelloporaria glomerata Gabb and Horn, Monograph of the Fossil Polyzoa of the Secondary and Tertiary formations of North America, Jour. Academy of Natural Sciences, Philadelphia, ser. 2, vol. 5, p. 134, pl. 19, fig. 15, 1862.

Osthimosia glomerata Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 602, pl. 74, figs. 12-19, 1920.

One of the specimens collected at Montgomery, Louisiana (fig. 6), is apparently better preserved than those figured by Canu and Bassler. This species is characterized by the oval, superficial zooecium with the surrounding large areolae, large oral avicularium that point toward the base, an orbicular aperture with a proximal rimule, and the smooth ovicell that opens high above the aperture.

The oriented marginal zooecia have a large avicularium (0.15 mm. long), but are devoid of ovicells.

The globular zoarium is incrusting a fragment of a shell.

Morphotype: Louisiana State University Museum Collection No. 1445.

Genus Acanthionella Canu and Bassler, 1917

Acanthionella oecioporosa Canu and Bassler

Plate 27, figures 7, 9.

Plate 28, figures 1, 3.

Acanthionella oecioporosa Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 614, pl. 17, figs. 1-14, 1920.

> The zoarium is free, bilamellar, with fronds more or less rounded. The oriented zooecia are indistinct; the frontal is a very thick olocyst perforated by two to five small avicularia. The apertura (interior) is oval and garnished by a long proximal lyrula; the peristomice (exterior) is orbicular; the peristomie is very deep and contains sometimes an avicularia bearing the lyrula. The ovicell is buried in the distal zooecia; it opens into the peristomie; it bears a frontal area closed by a much branched spine. The young zooecia and the cumulate zooecia are distinct, elongated, gibbose. The interzooecial avicularia are rare, of the size of the zooecia, elliptical, and provided with a pivot.

This distinctive species has a large lyrula. On the young zooecia the frontal is gibbose, and the avicularia are not so numerous.

The zooecia have an average length of 0.60 mm. This is much larger than the figure of Canu and Bassler, (length = 0.35 mm.), but such variations exist on several specimens observed of this species.

Occurrence: Claiborne (Cook Mountain formation): St. Maurice, Louisiana (rare). Lower Jackson: Montgomery, Tullos, Gibson Landing, Stock Landing and Bunker Hill. Upper Middle Jackson: Danville Landing, Ouachita River, Louisiana (rare).

Morphotype: Louisiana State University Museum Collection No. 1448.

Genus Kleidionella Canu and Bassler, 1917

Kleidionella grandis Canu and Bassler

Plate 9, figures 4-9.

Plate 11, figures 10-11.

Kleidionella grandis Canu and Bassler, U. S. Nat. Mus. Bull. 96, p. 72, pl. 6, figs. 9, 10, 1917.

Kleidionella grandis Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 617, pl. 78, figs. 1-17; pl. 79, fig. 1, 1920.

> The zoarium is very large, compressed, formed of bifurcated fronds almost in the same plane, attaining toward the base 2 cm. 5 mm. in width. The zooecia are disposed in two groups, back to back and inseparable. The axial zooecia are oriented; all the other zooecia are cumulate. The superficial are distinct, urceolate, little raised, very oblique; the frontal is quite convex, smooth, bearing from 0 to 3 improminent avicularia with pivot; the frontal is formed of a very thick olocyst. The aperture is oval, deeply embedded at the base of a peristomie; the peristomice is irregular, suborbicular. The deep zooecia have a flat frontal, their avicularia are prominent between the superficial zooecia; they have a pivot; their orifice is like the beak of a duck; the passage of the reflexor muscles of the operculum is indicated by the very small perforations on the inferior cavity; the beak is salient above the zoarium. The incomplete zooecia are quite numerous. On many zoaria there are some distinct groups of large zooecia and of small zooecia.

The zooecia are 0.50-0.60 mm. long.

The very large zoarium is distinctive of the species, and it may easily be determined in the field.

This species was given a range by Canu and Bassler from the Vicksburg (Red Bluff clay) in Mississippi, into the Lower Jackson (Moody's marl). Of the samples analyzed in Louisiana, the author has found it only at Rosefield.

Morphotype: Louisiana State University Museum Collection No. 1450.

Kleidionella sp.

Plate 11, figures 7-8.

The only fragment of the bilamellar zoarium observed has oriented zooecia with numerous avicularia, some of them possessing pivots. The aperture is smaller than the exterior orifice, deep, and oval. No ovicells were noted.

The aperture has a length of 0.16 mm. and a width of 0.10 mm.

Specimen No. 1451, Louisiana State University Museum Collection, from Rosefield, Louisiana.

Division 3. Hexapogona

Family Mamilloporidae Canu and Bassler, 1927

Genus Mamillopora Smitt, 1873

Mamillopora tuberosa Canu and Bassler

Plate 4, figures 3, 5-6, 9.

Stichoporina tuberosa Canu and Bassler, Contributions to the Geology and Paleontology of the West Indies, Carnegie Institution of Washington, p. 98, pl. 1, figs. 20-23; pl. 6, figs. 16-19; pl. 7, figs. 1-8, 1919.

Mamillopora tuberosa Canu and Bassler, U. S. Nat. Mus. Bull. 125, p. 192, pl. 6, figs. 16-19; pl. 7, figs. 1-8, 1923.

> The zoarium is free, conical, hollow, with very thick walls. The peristome is salient, ornamented with small tuberosites; it bears one or two small avicularia with bar or denticles. The apertura is elliptical, elongated, hidden at the base of a short peristomie; it is formed of a large semi-elliptical anter and of a small concave poster, separated by two small, salient cardelles. The ovicell is large, somewhat salient, convex; it is hyperstomial and always closed by the operculum. A salient, elliptical avicularium, with two denticles serving as pivot, is placed at the base of each zooecium; it deforms the adjacent peristomes. The inner side is tuberose and bears very large pores arranged in quincunx. On the lower face there are large pores surrounded by very small ones.

The pictured specimens are not well preserved, the tuberosites being only slightly visible. The inner face is tuberose, but the arrangement of the pores is not definite.

Occurrence: Lower Miocene: Superior Oil Producing Co., Hernandez No. 1 well, Sec. 34, T. 8S., R. 3E., Acadia Parish, 8393.

Morphotype: Louisiana State University Museum Collection No. 1455.

Family Orbituliporidae Canu and Bassler, 1923

Genus Schizorthosecos Canu and Bassler, 1917

Schizorthosecos interstitia Lea

Plate 28, figures 6-7, 9-10.

Plate 29, figures 1-2.

Orbitolites interstitia Lea, Contributions to Geology, Philadelphia, p. 191, pl. 6, fig. 204, 1863.

Schizorthosecos interstitia Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 626, pl. 18, figs. 1-9, 1920. (For further references see the last reference given above).

> The zoarium is cupuliform, little deep. The zooecia are distinct, tubular, erect, terminated by a narrow peristomie. The apertura is placed at the base of the peristomie; in its rimule, it often has a flat lyrula; the peristomice is of the same form as the apertura. Between the peristomes, on the external surface, there are numerous zooeciules, which are transformed according to their position into radicular zooeciules, into avicularia with pivot, or into compensation zooeciules. On the inner face each zooecium is indicated by a hexagon perforated with six to ten large tremopores, which are the orifices of long tubules; some large avicularia with pivot surround the ancestrula.

Some of the many variations in the zooecia, and on the inner face of the zoarium can be observed from the figures.

Occurrence: Claiborne (Cook Mountain formation): St. Maurice and 2.6 miles southeast of Arcadia. Lower Jackson: Montgomery (very common), Tullos, Gibson Landing, Heison Bluff, Bunker Hill, Grandview Bluff and Stock Landing. Upper Jackson: Danville Landing (common).

Morphotype: Louisiana State University Museum Collection No. 1458.

Schizorthosecos grandiporosum Canu and Bassler

Plate 29, figures 3-5.

Schizorthosecos grandiporosum Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 627, pl. 18, figs. 10-15, 1920.

The zoarium is cupuliform and little concave. The zooecia are distinct exteriorly, tubular, terminated by a contracted peristomie. The apertura is placed at the base of the peristomie; it bears a rounded rimule; the peristomice is oval. The peristomes are separated by some compensation zooecials with irregular orifices. On their inner face the zooecia are indistinct; they contain one large and one small pore to each. At the base of each zooecium there are a dozen very small pores.

The inner face with the large pore is characteristic of this species.

Occurrence: Claiborne (Cook Mountain formation): St. Maurice, Louisiana (rare); Lower Jackson: Montgomery, Tullos and Heison Bluff (very rare).

Morphotype: Louisiana State University Museum Collection No. 1459.

Schizorthosecos danvillensis McGuirt, n. sp.

Plate 28, figures 2, 4-5, 8.

The zoarium is cupuliform, little concave on the inner side. The tubular, distinct zooecia are terminated by a peristomie. The aperture is deep on the peristomie and has a rounded rimule. Between the peristomes are well developed unsymmetrical zooeciules with a projecting orifice, and avicularia with pivots. On the under side the ribs are radial, distinct, perforated by numerous, irregular small pores that are not separated into any pattern.

The pictured specimens differ from Schizorthosecos interstitia in having radial ribs perforated by numerous pores on its inner side. Another characteristic is the great development of the orifices of the zooeciules.

Occurrence: Lower Jackson: Tullos, Montgomery and Heison Bluff. Upper Jackson: Danville Landing, Ouachita River, Louisiana (very rare).

Holotype: Louisiana State University Museum Collection No. 1460.

Order Cyclostomata Busk

Suborder Tubuliporina Hagenow, 1851

Family Crisiidae Johnston, 1847

Genus Crisia Lamouroux, 1812

Crisia hornesi Reuss

Plate 12, figure 2, 10-12.

Crisia hornesi Reuss, Die fossilen Polyparien des Wiener Tertiarbeckens Haidinger's Naturwissenschaftliche Abhandlunger, pt. 2, Wien, p. 54, pl. 7, fig. 21; pl. 11, fig. 28, 1847.

Crisia hornesi Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 704, pl. 141, figs. 1-4, 1920. (For further references see last reference above).

The pictured specimens of the zoaria with zooecia on each side do not possess an ovicell. The distance between the apertures varies from 0.20-0.27 mm., and is approximately equal to the zooarial width. There appears to be 16-18 tubes to a segment.

Occurrence: Lower Jackson: Heison Bluff and Montgomery (very rare). Vicksburg: Rosefield, Louisiana (rare).

Morphotype: Louisiana State University Museum Collection No. 1470.

Family Heteroporidae Pergens and Meunier, 1886

Genus Heteropora Blainville, 1830

Heteropora ovalis Canu and Bassler

Plate 29, figures 6-8.

Heteropora ovalis Canu and Bassler, U. S. N. M., Bull. 106, pp. 682-683, pl. 150, figs. 1-6, 1920.

> The zoarium is free, branched, arborescent or dichotomous; the branches are cylindrical. The apertures are somewhat oval, slightly salient, and measure 0.10 mm. in diameter. The mesopores are numerous and polygonal. In sections the tubes are cylindrical, the walls are not vesicular. The mesopores are short, regular, and parietal.

The apertures of the pictured specimens measure 0.09-0.12 mm. in diameter. The exterior appearance of the specimens found at the Montgomery locality is characteristic of the solid zoarium.

Morphotype: Louisiana State University Museum Collection No. 1473.

Family Plagioeciidae Canu, 1918

Genus Plagioecia Canu, 1918

Plagioecia discoidea Canu and Bassler

Plate 12, figures 5, 9.

Plagioecia discoidea Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 717, pl. 155, figs. 12-17, 1920.

> The zoarium is free, orbicular, with the form of true Discosparsa. The tubes are distinct, cylindrical, smooth, bent upward at their extremity, arranged in regular quincunx; the peristome is elliptical, horizontal, thin. The zone of growth is hardly visible.

The concentric wrinkles on the under side are low and wide. The raised peristomes have not been observed on the specimens pictured. The distance between the peristomes is variable. Covering the zoarium are numerous very small pores.

Occurrence: Vicksburg: Rosefield, Louisiana (common).

Morphotype: Louisiana State University Museum Collection No. 1476.

Family Entalophoridae Reuss (Mecynoeciidae Canu, 1918)

Genus Entalophora Lamouroux, 1821

Entalophora cylindrica Canu and Bassler

Plate 12, figures 3, 6.

Mecynoeica cylindrica Canu and Bassler, U. S. Nat. Museum, Bull. 106, p. 727-728, pl. 127, figs. 1-7, 1920.

> The zoarium is an Entalophora, regularly cylindrical, bifurcated. The tubes are cylindrical, visible, separated by a very thin, salient thread; the peristomes are salient, orbicular, regularly arranged in quincunx. The ovicell is a large pyriform sack whose oeciostome is isolated.

The branches are irregular in size averaging about 1.00 mm. in diameter. The peristome is 0.10 mm. in diameter. The species that occur rarely at Rosefield and Montgomery are finely perforated. Complete ovicells have not been observed on the specimens examined.

The average distance between the peristomes is 0.45 mm.

Morphotype: Louisiana State University Museum Collection No. 1480.

Entalophora semota Canu and Bassler

Plate 12, figures 1, 4, 7.

Mecynoecia semota Canu and Bassler, U. S. Nat. Mus. Bull. No. 106, pp. 731-732, pl. 156, figs. 9-25, 1920.

> The zoarium is a cylindrical or claviform Entalophora never containing more than eight longitudinal rows of zooecia. The tubes are horn-shaped, narrowed at the back, enlarged in the vicinity of the peristome, distinct, convex, striated transversally, bent upward at their extremity and terminated by a free peristome; very oblique and salient; their peristomes are widely separated from each other, orbicular or elliptical. The ovicell is an elongate and symmetrical sack.

The specimens observed have a zoarial diameter less than 1.00 mm. as described by Canu and Bassler. The zooecia are finely perforate. The transverse striations are present, but are not very conspicuous.

Distance between the peristomes varies from 0.60 mm. to 1.00 mm. Diameter of the zooecia ranges from 0.35 mm. to 0.60 mm.

The peristomes have a diameter of 0.12-0.16 mm.

Occurrence: Vicksburg: Rosefield, Louisiana (rare).

Morphotype: Louisiana State University Museum Collection No. 1481.

Family Diaperoeciidae Canu, 1918

Genus Crisulipora Robertson, 1910

Crisulipora sp.

Plate 13, figures 1-2.

The single specimen observed in flabellate with circular tubes. The peristomie is elongate and curved. The peristome is very thin. Many very minute perforations cover the entire specimen. A few concentric wrinkles are present on the under side.

The peristomes have a diameter of 0.10-0.12 mm., and are separated by a distance of 0.50-0.60 mm.

This species occurs very rarely at Rosefield, Louisiana.

Specimen No. 1485, Louisiana State University Museum Collection.

Crisulipora cf. C. promiens Canu and **Bassler**

Plate 13, figures 3, 5.

Plate 30, figures 8-9.

Crisulipora promiens Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 749, pl. 154, figs. 12-20, 1920.

The triserial segment from Rosefield, Louisiana, possesses long peristomies. The peristome of the round tubes is thin, orbicular.

The peristomes have a diameter of approximately 0.10 mm. The average distance between the orifices is 0.50 mm.

Morphotype: Louisiana State University Museum Collection No. 1486.

Family Tubuliporidae Johnston, 1838

Genus Pleuronea Canu and Bassler, 1920

Pleuronea fenestrata Busk

Plate 13, figures 4, 6-9.

Idmonea fenestrata Busk, A Monograph of the Fossil Polyzoa of the Crag, Publications of the Paleontographical Society of London, vol. 14, p. 105, fig. 6, 1859.

Pleuronea fenestrata Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 766, pl. 114, figs. 1-18, 1920. (For further references see Canu and Bassler, U. S. Nat. Mus. Bull. 106, 1920, p. 766).

> The zoarium is free, arborescent, bifurcated or reticulated with oval section, idmoneiform. The fascicles are quite salient, uniserial, scattered, alternate, adjacent to the median crest. They bear at the maximum five tubes. The tubes are salient, visible exteriorly, flat, separated by a salient thread; the peristome is thin and rectangular. The basal lamella bears a thick layer of tergopores almost as large as the tubes; their orifice forms regular, longitudinal lines or a complicated network. The ovicell is large, convex, porous; it bears tuberosities arranged in quincunx.

The distance between the fasciciles varies from 0.30 mm. to 0.42 mm. The diameter of the peristome averages 0.12 mm. These measurements vary somewhat as most of the tubes are broken on the ends. However, the figured specimens of Canu and Bassler check with these measurements.

The dorsal side of the zooecia with the tergopores, and the dimensions characterizes this species.

Occurrence: Lower Jackson: Montgomery, Tullos, Stock Landing, Heison Bluff and Danville Landing. Vicksburg: Rosefield.

Morphotype: Louisiana State University Museum Collection No. 1490.

Genus Erkosonea Canu and Bassler, 1920

Erkosonea semota Canu and Bassler

Plate 29, figures 9-11.

Erkosonea semota Canu and Bassler, U. S. Nat. Mus. Bull. 106, p. 763-764, pl. 133, figs. 1-13, 1920.

> The zoarium is idmoneiform, linear, bifurcated, with oval transverse section. The fasciciles are quite salient, scattered. Formed of five zooecia, they border the zoarial margins and are almost opposite on each side of the median crest. The tubes are visible convex, separated by a slight salient thread; the peristome is thin, round or rectangular. The dorsal is hardly convex; it is formed by a thick layer of dactylethrae closed by a thin calcareous lamella. The dactylethrae appear on the frontal at the bifurcations.

The distance between the fasciciles averages 0.80 mm. The tubes have an average diameter of 0.23 mm. In some instances the fascicles are formed of four zooecia instead of five.

The dorsal lamella with the rows of dactylethrae is characteristic of this species.

Occurrence: Jackson: Tullos and Heison Bluff (rare).

Morphotype: Louisiana State University Museum Collection No. 1496.

Family Horneridae Gregory, 1899

Genus Hornera Lamouroux, 1821

Hornera jacksonica Canu and Bassler

Plate 30, figures 1-3, 6-7, 10.

Hornera jacksonica Canu and Bassler, U. S. Nat. Mus. Bull. No. 106, p. 797, pl. 143, figs. 1-26, 1920.

> The zoarium is elliptical, ramified in the strict sense at a very acute angle. The tubes are invisible exteriorly; they bear from two to four vacuoles, two of which are adjacent to the apertura and are arranged at the base of one or two oblique sulci. The peristome is orbicular and little salient. The dorsal bears longitudinal sulci narrower than the nerui, and rather large vacuoles. The ovicell is elongated, elliptical, very globular and quite punctate.

The observed specimens have peristomes with diameters of 0.10 mm.-0.12 mm.

The oval aperture and large vacuoles are characteristic of this species.

Occurrence: Lower Jackson: Tullos, Louisiana.

Morphotype: Louisiana State University Museum Collection No. 1498.

Family Lichenoporidae Smitt, 1866

Genus Lichenopora Defrance, 1823

Lichenopora grignonensis Milne-Edwards

Plate 30, figures 4-5, 11.

Plate 31, figure 1.

Lichenopora crispa Defrance, Dictionnaire des Sciences naturalles, vol. 29, p. 25, 1823.

Lichenopora grignonensis Canu and Bassler, U. S. Nat. Mus. Bull. No. 106, p. 818, pl. 29, figs. 1-11, 1920. (For complete references see last reference above).

> The zoarium is simple, free, and discoidal or composite incrusting, formed of a lamella with adjacent subcolonies. The basal lamella is thick and striated concentrically. The central area is large and concave. The fascioles are salient, solely in the vicinity of the central area; they are uniserial, short, and never reach the zoarial margins. The tubes are small, recumbent, provided with a visor; they are arranged in quincunx in the vicinity of the zoarial margins. The cancelli are polygonal and small. The ovicell placed in the central area covers over the cancelli.

The specimens from Heison Bluff and Montgomery display the usual features of the species as shown in the figures.

Morphotype: Louisiana State University Museum Collection No. 1499.

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Biography

James Holland McGuirt was born in Shreveport, Louisiana, on December 11, 1910. Following graduation from the C. E. Byrd (Shreveport) High School in 1927, he entered the Louisiana State University. The Bachelor of Science Degree was received in Petroleum Engineering in June, 1932. He re-entered the State University in 1932 as a graduate student in the School of Geology. From 1932-1934 he assisted in the Petroleum Engineering Department in the capacity of a Teaching Fellow. In June, 1934, he received the degree of Master of Science in Geology. He began the 1934-1935 school year at Louisiana State University as a Teaching Fellow in the School of Geology. He was appointed Assistant State Geologist immediately after the reorganization of that Survey in October, 1934, and has retained that position until the present.

Mr. McGuirt is affiliated with the Phi Kappa Phi Honorary Fraternity, The Geological and Mining Society of American Universities, and the Sigma Alpha Epsilion Social Fraternity.

Plates I-XXXI

Plate 1

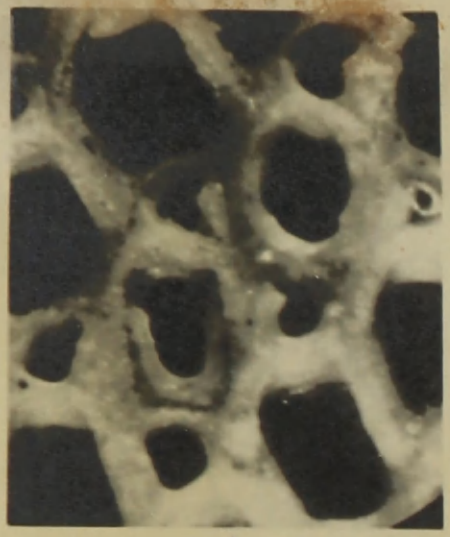
Figures — Page

1-3, 5-6, 8. Cupuladria canariensis Busk, 1859. Collection No. 1253 44

1. Portion of a zoarium, x 80, showing the vibracula and opesia. Locality 2.
2. Lower side of a specimen, x 13.1. Locality 1.
3. Upper surface of same specimen, x 13.1. Locality 1.
5. Two fragments, x 4.8. Locality 1.
6. A weathered specimen, x 13.1. Locality 2.
8. Celluliferous side of another specimen, x 68. Locality 2.

4, 7, 9-11. Discoporella umbellata Defrance, 1823. Collection No. 1325 77

4. Outer surface, x 78, showing the spinous processes. Locality 1.
7. Inner face of the discoid zoarium, x 14. Locality 1.
9. Upper surface of same specimen, x 14.
10. Two zoaria, x 4.8.
11. Surface of a specimen, x 12.7, with most of the spinous processes broken. Locality 2.



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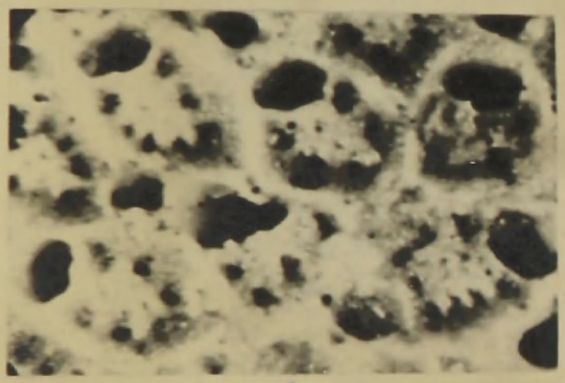

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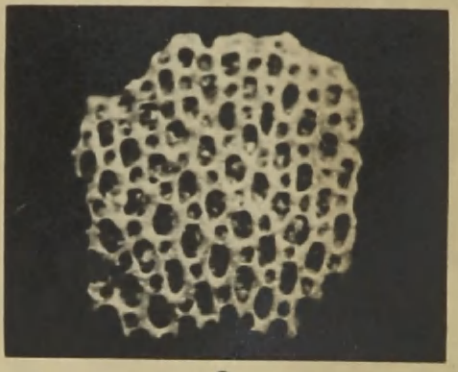

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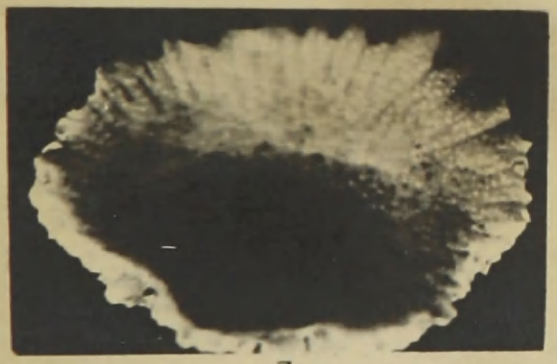

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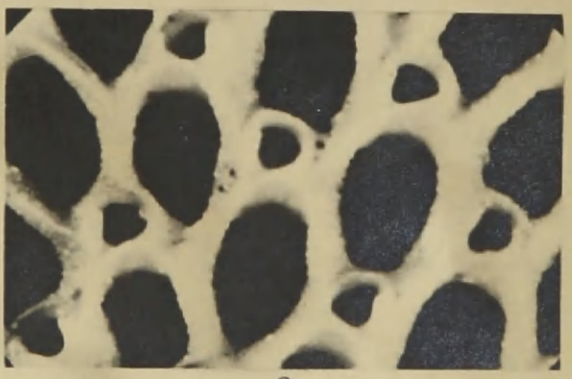

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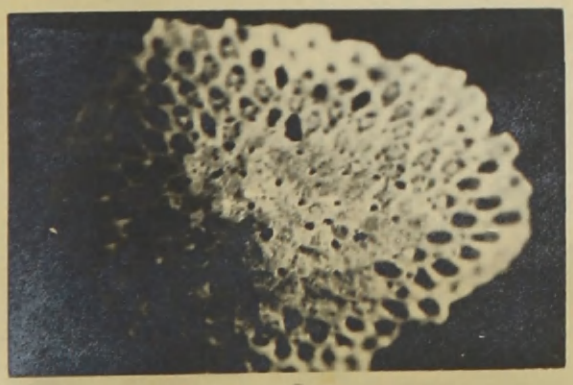

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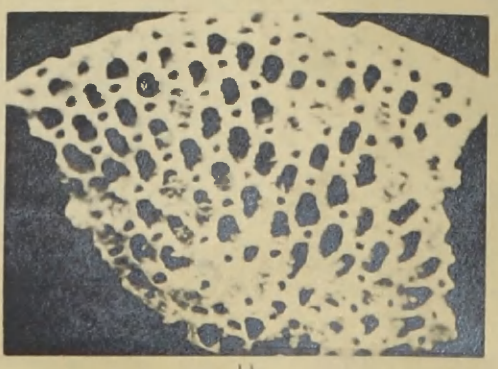

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PLATE I

Plate 2

Plate F-(Continued)

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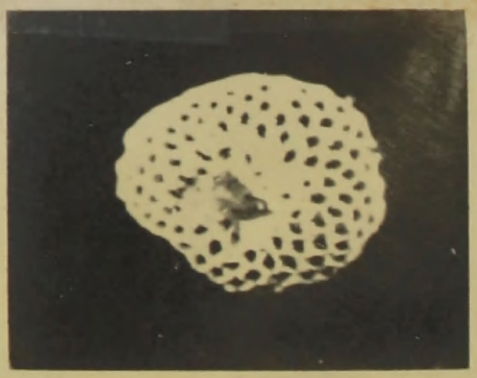

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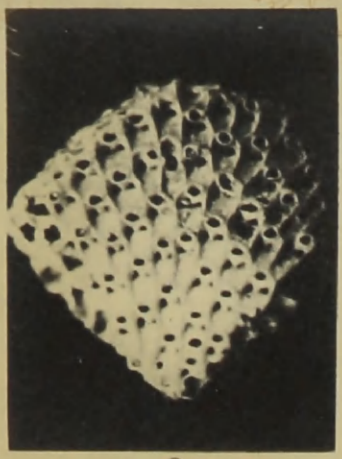

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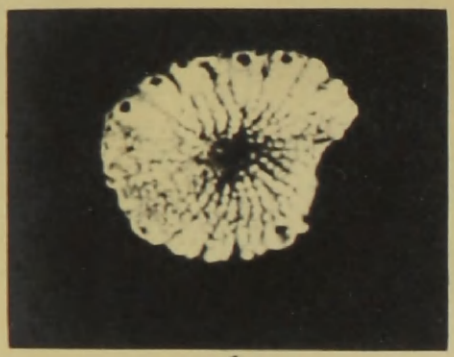

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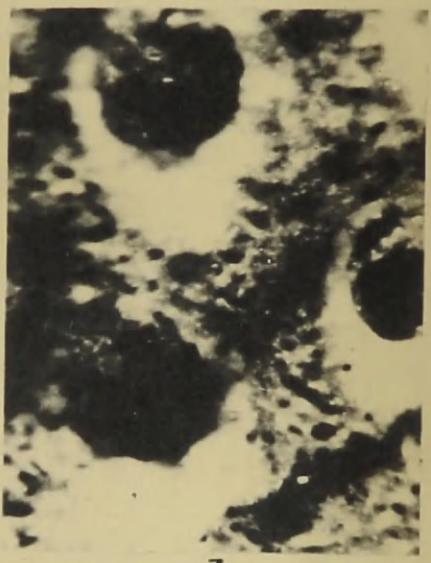

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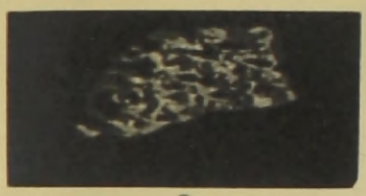

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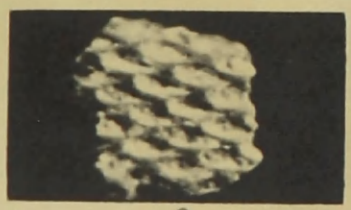

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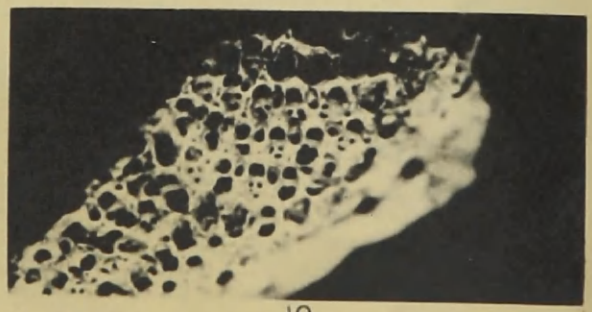

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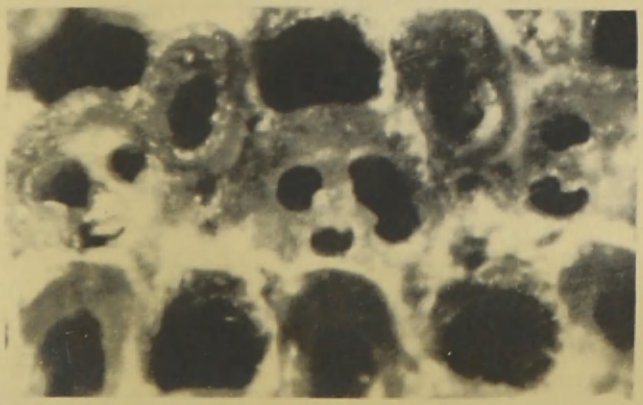

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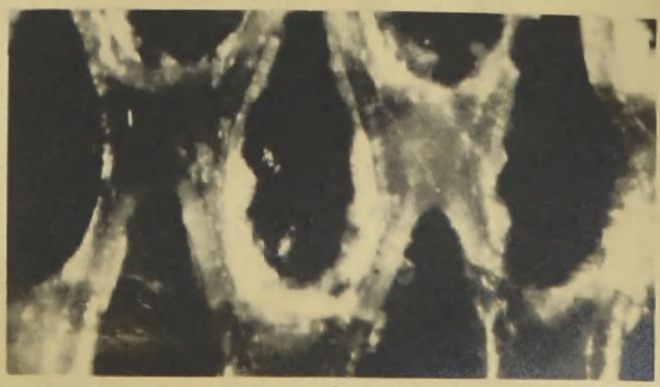

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PLATE II

Plate 3

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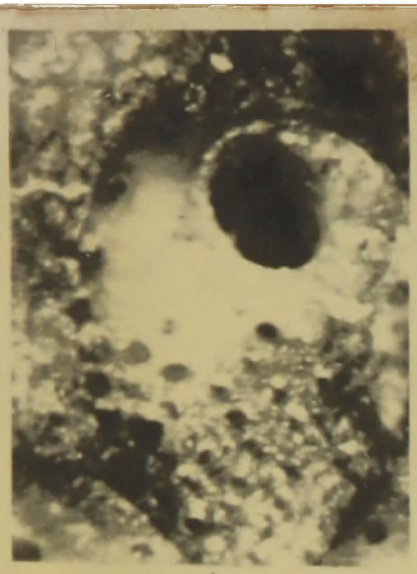

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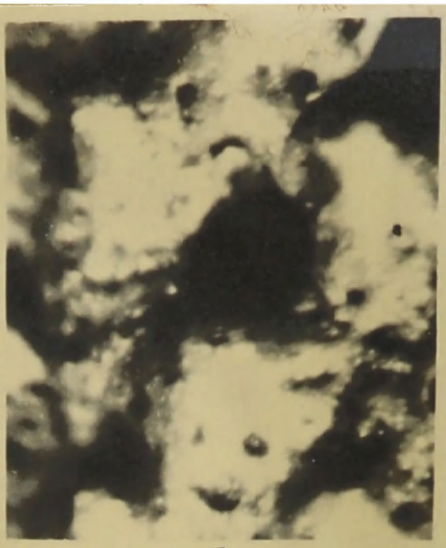

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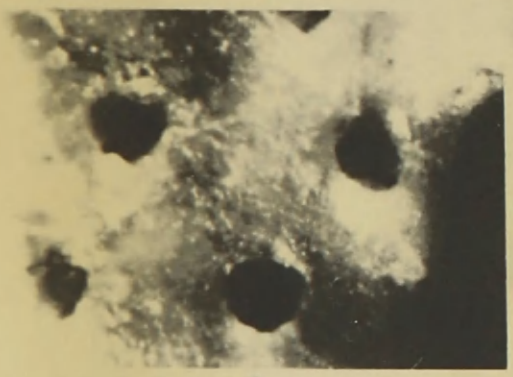

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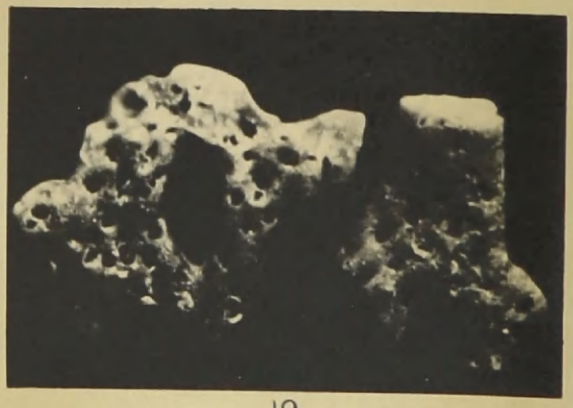

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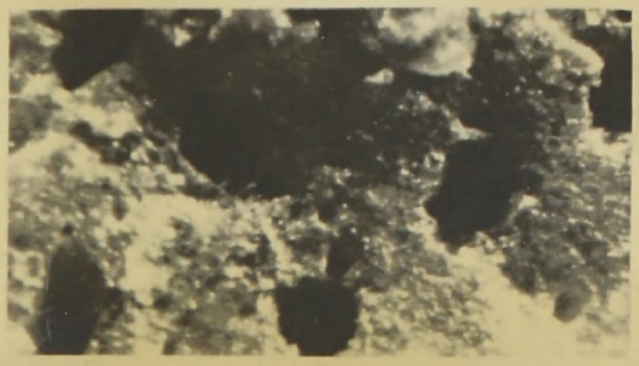

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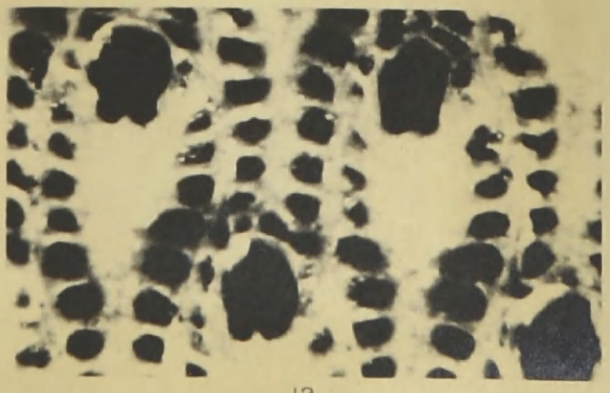

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PLATE III

Plate 4

Figures — Page

1, 2. Trigonopora colligatum Canu and Bassler, var. catahoulana McGuirt, n. var. (Continued from Plate 3) 123

1. Ovicell, x 82.3. Locality No. 2.
2. Surface of another specimen, x 84.2.

3, 5-6, 9. Mamillopora tuberosa Canu and Bassler, 1919. Collection No. 1455. Locality 2 138

3. Fragment of the free, conical zoarium, x 11.2.
5. Celluliferous side of two specimens, x 13.3.
6. Enlarged avicularium and peristomice, x 70.
9. Under side, x 70, with large pores, x 70.

4, 11. Trigonopora sp. Collection No. 1417. Locality 2 120

4. Young zoarium, x 13.3, with long zooecia.
11. Old specimen with flat frontal, x 13.3.

7-8, 10. Trigonopora sp. Collection No. 1418. Locality 4 121

7. Long, narrow zooecia, x 84.
8. Inner side of a zooecium, x 82.3, with aerolae.
10. Fragments of the bilamellar zoarium, x 11.2, The frontal and interior are pictured.

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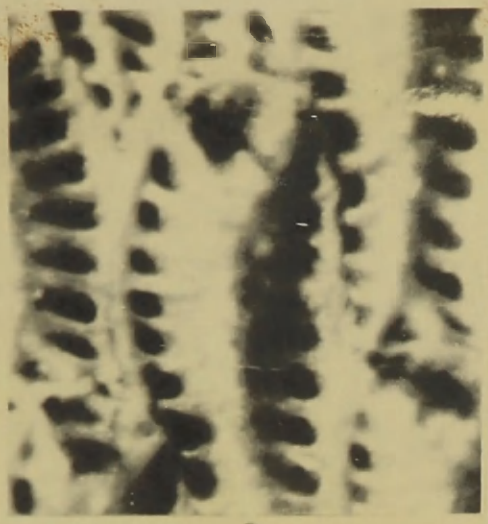

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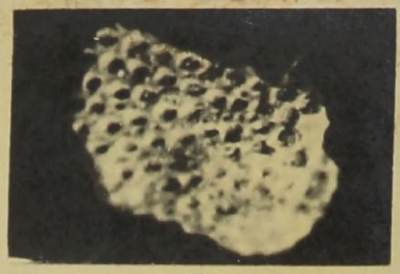

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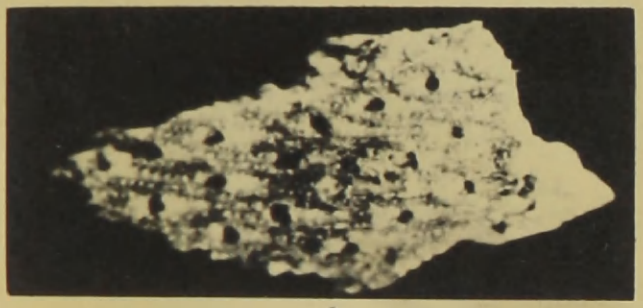

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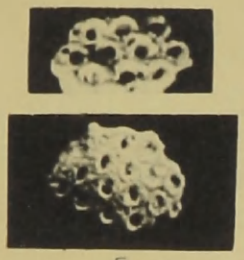

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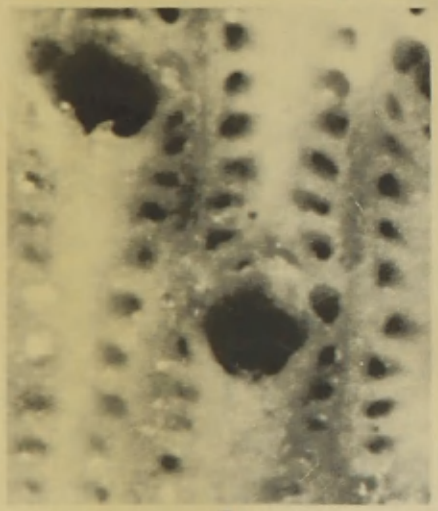

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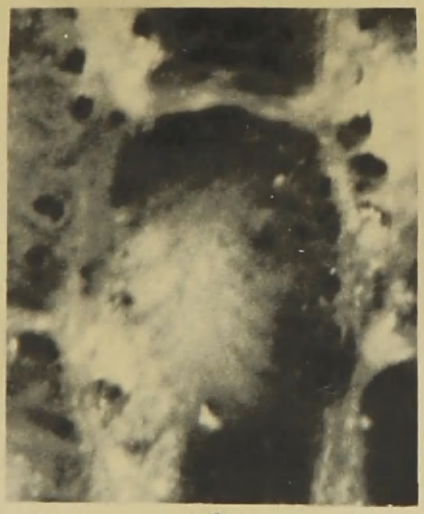

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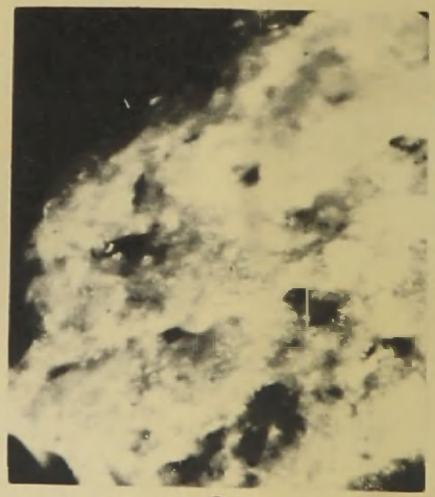

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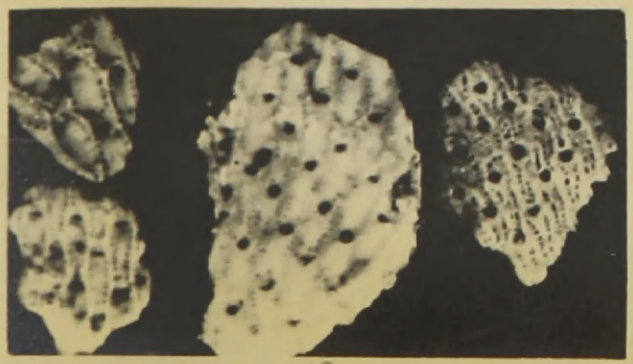

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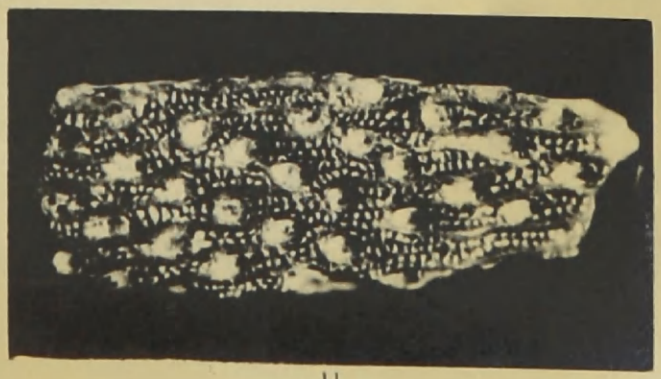

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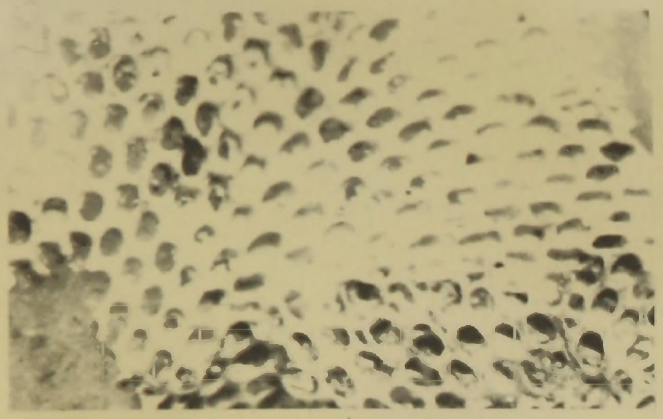
PLATE IV

Plate 5



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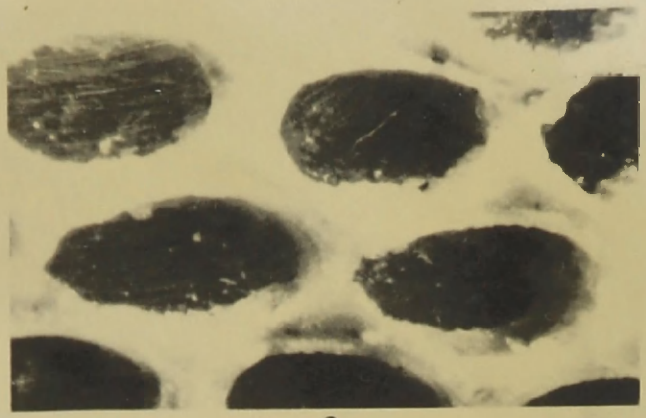

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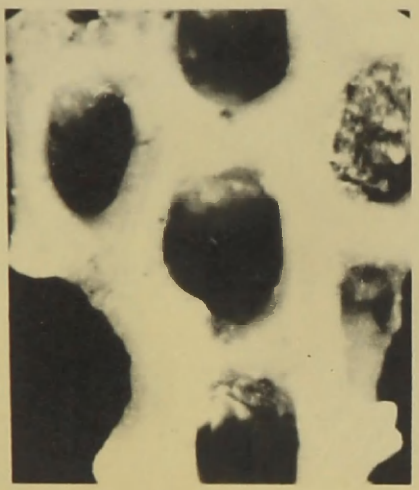

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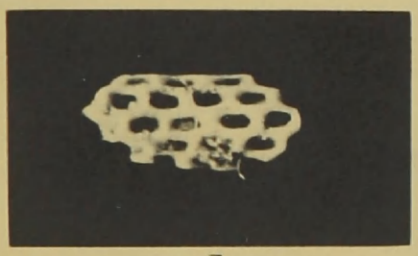

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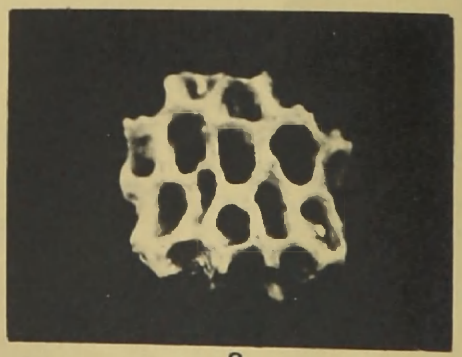

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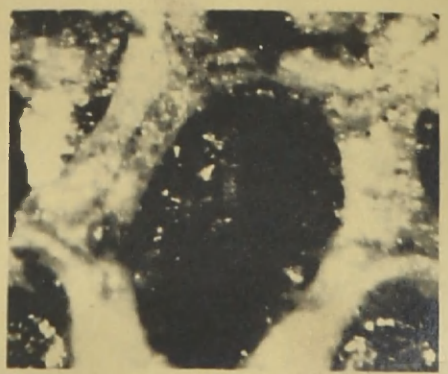

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PLATE V

Plate 6

Figures — Page

1-2, 4, 7. Stamenocella inferaviculifera Canu and Bassler, 1920. Collection No. 1294 60

1-2. Specimens, x 60, with ovicells and avicularia. Locality 12.

4. Fragment, x 82.3, without avicularia. Locality 4.

7. Three zoaria, x 9.2. Locality 12.

3, 5, 10. Reptolunulites tintinabula Canu and Bassler, 1920. Collection No. 1302. Locality 4 64

3. Example, x 14, with constant interzooecial vibracula.

5. Surface of a fragment, x 82.3. The concave cryptocyst, and the two condyles of the vibracula.

10. Inner surface, x 82.3, with scattered pores.

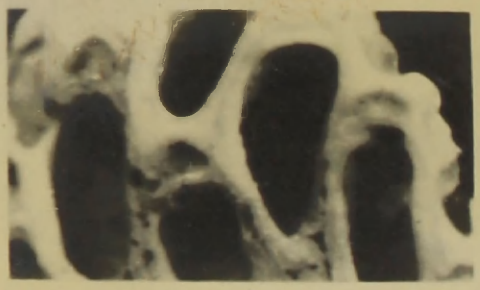
6, 8-9, 11. Reptolunulites (Oligostresium) vicksburgensis Conrad, 1848. Collection No. 1305. Locality 4 67

6. Surface of a zoarium, x 82.3.

8. Inner side, x 82.3, illustrating convex, perforated rows.

9. Fragment, x 13.1, with inconstant avicularia.

11. Transverse view, x 82.3.



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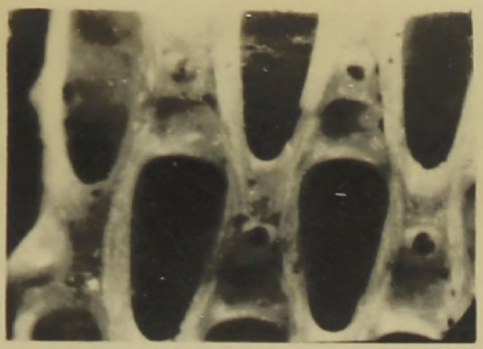

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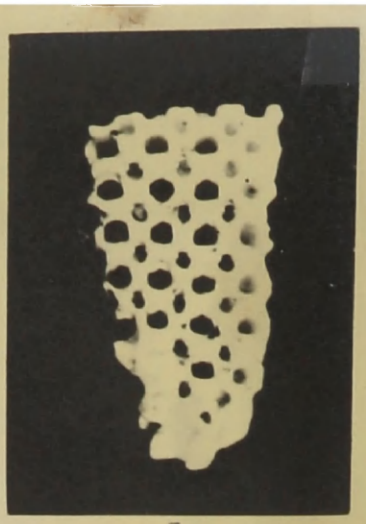

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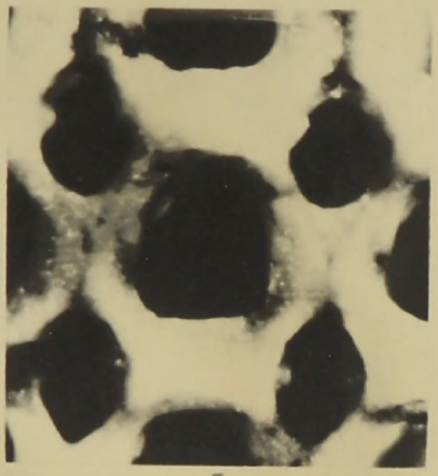

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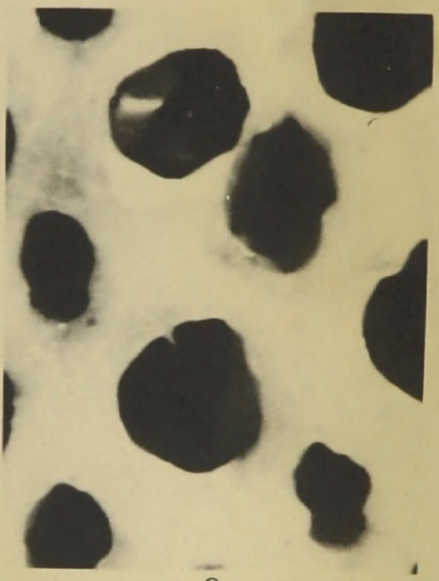

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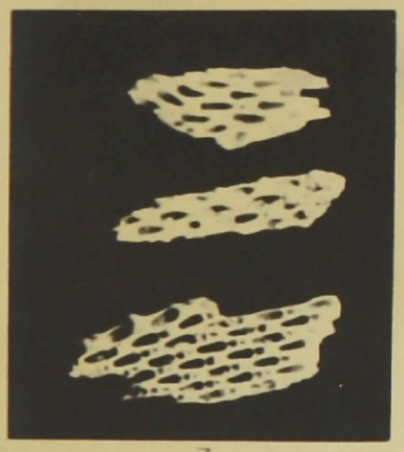

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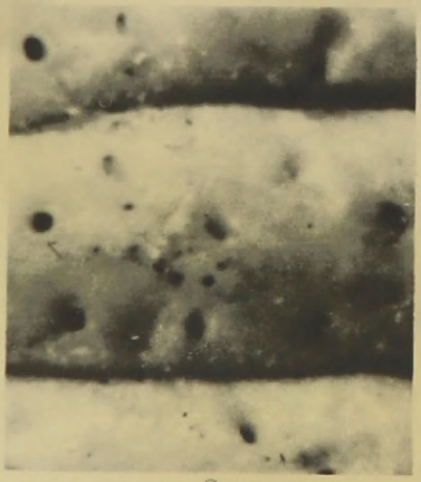

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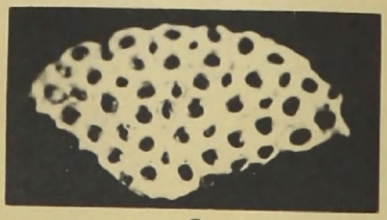

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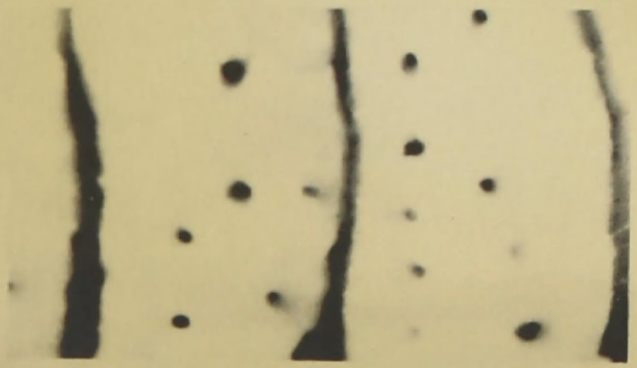

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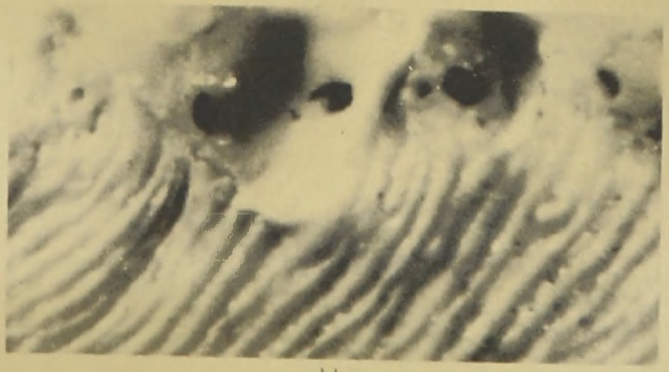

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PLATE VI

Plate 7

Plate 7-(Continued)

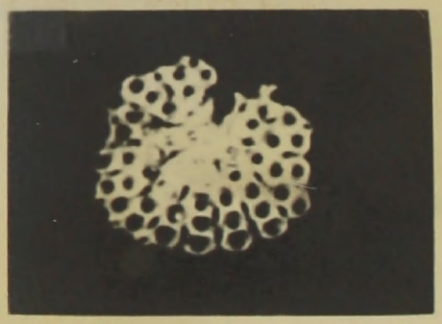
Figures | Page

Surface of the specimen, x 76, with the perforated and granular cryptocyst.

12. Nellia sp.

Illustrating the peculiar appearance of the avicularia and zooecium, x 76.

Collection No. 1333. Locality 4 81



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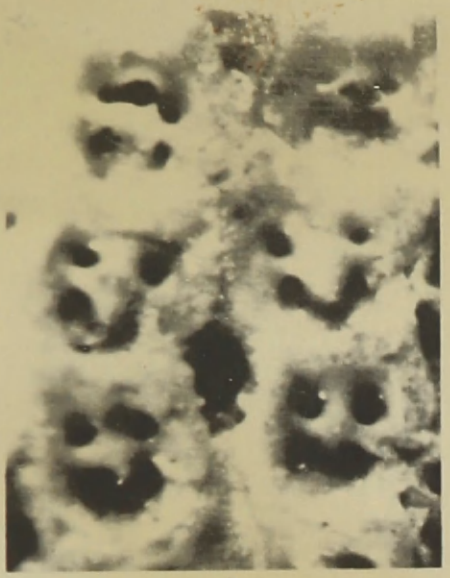

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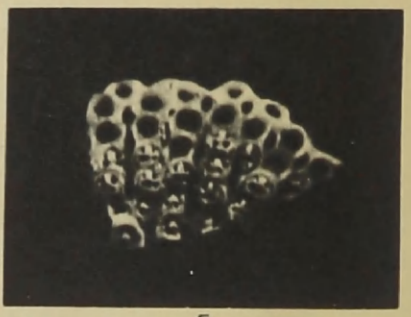

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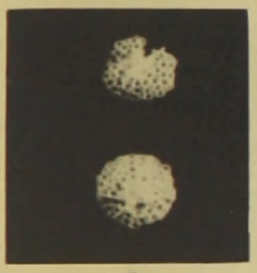

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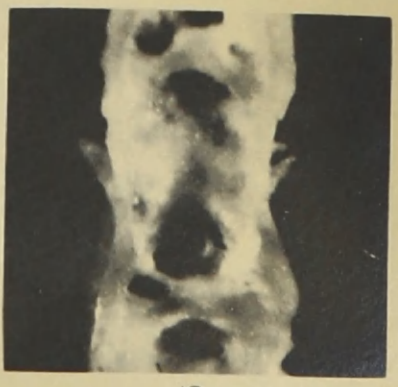

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PLATE VII

Plate 8

Plate 8-(Continued)

Figures Page

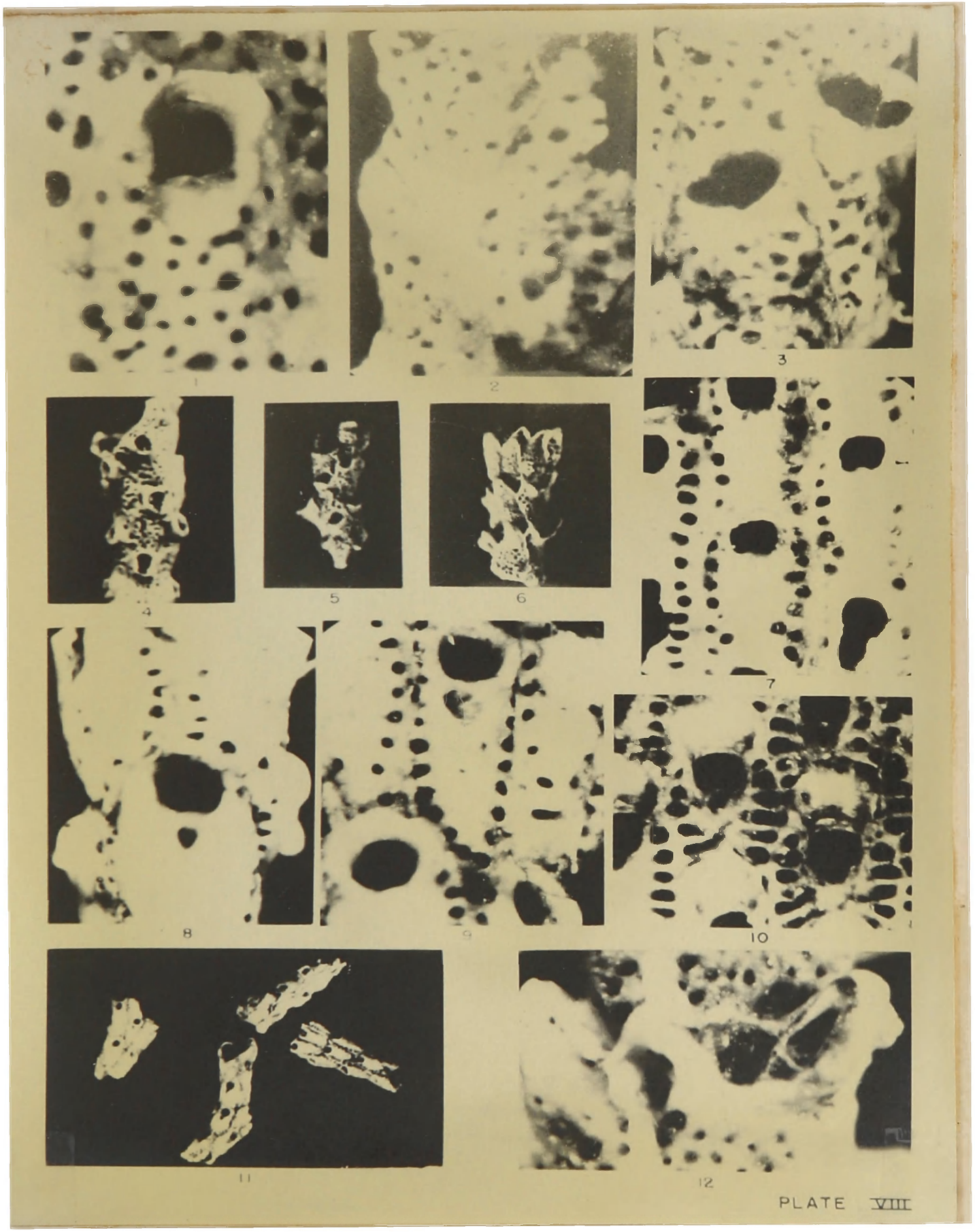


PLATE VIII

Plate 9

Figures — Page

1. *Perigastrella* sp.
   Collection No. 1426. Locality 4 126
   Illustrating the incrusting zoarium with erect zooecia, x 82.3.

2. *Puellina radiata* Moll, *var. carolinensis* Gabb and Horn, 1862.
   Collection No. 1341. Locality 4 84
   Surface of the incrusting zoarium, x 84.2, with the smooth ovicell and sixteen costules.

3. *Micropora* ? sp.
   Collection No. 1317. Locality 12 62
   Portion of small, incrusting zoarium, x 87.4.

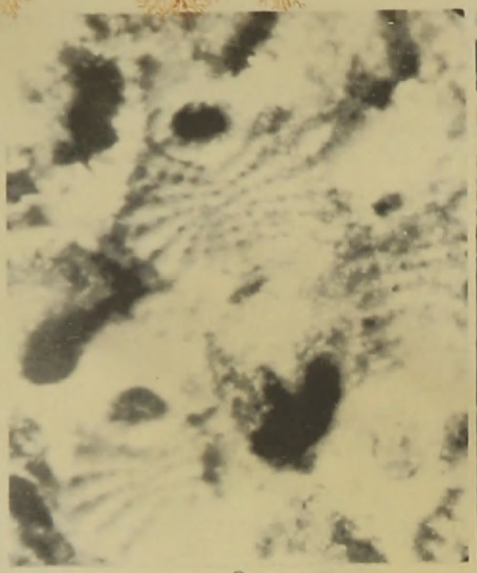
4-9. *Kleidionella grandis* Canu and Bassler, 1917.
   Collection No. 1450. Locality 4 136

4. Cross-section of a specimen, x 14.3.

5. Transverse section of another specimen, x 4.1.

6, 8, 9. Three zoaria, x 4.2.

7. Surface of a specimen, x 14.4.



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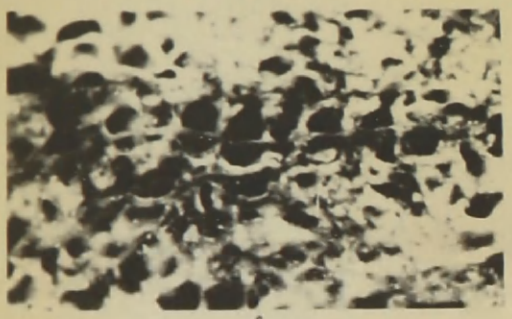

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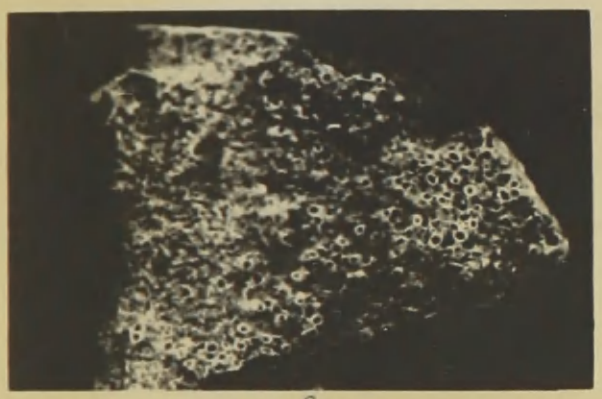

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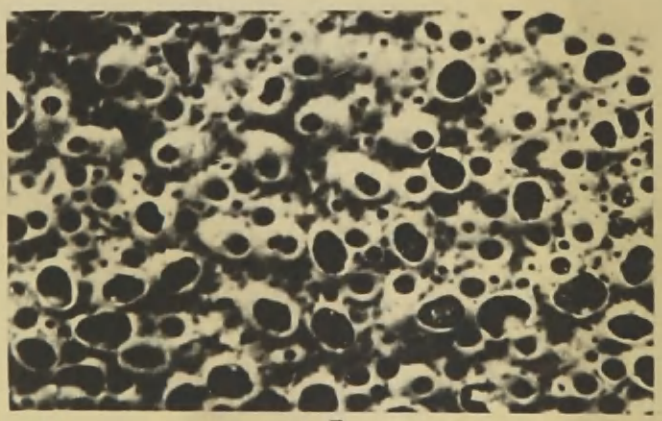

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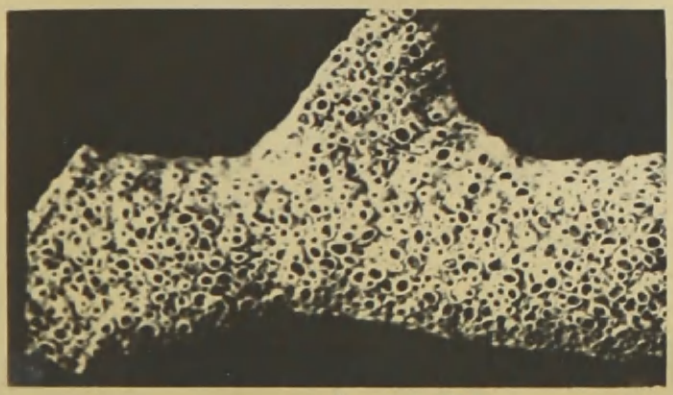

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PLATE IX

Plate 10

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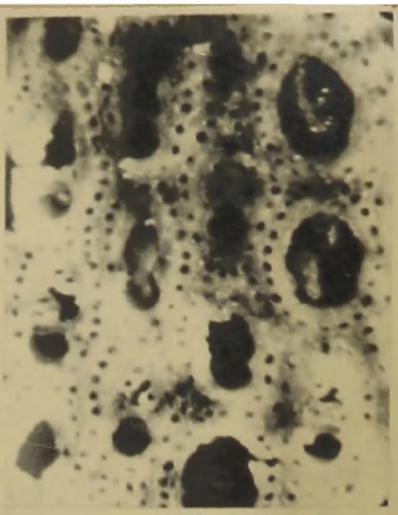

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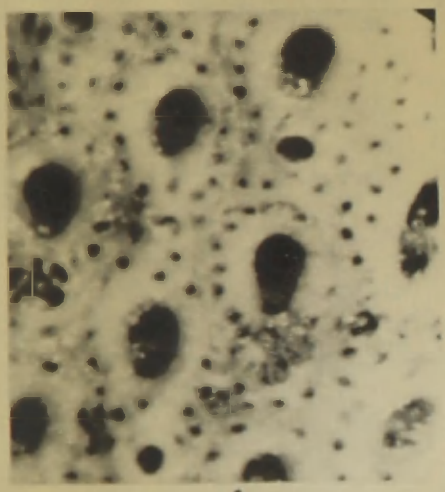

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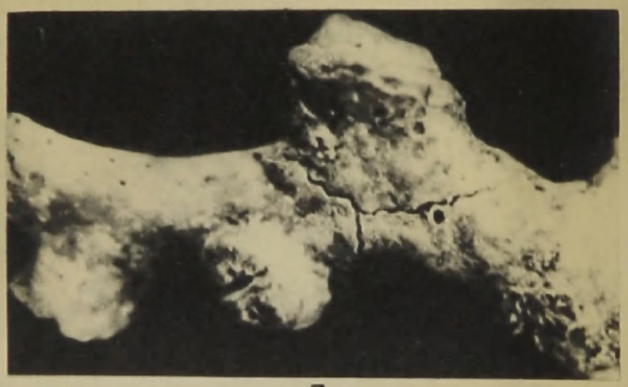

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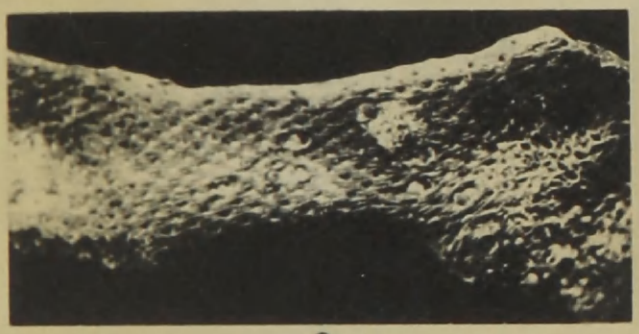

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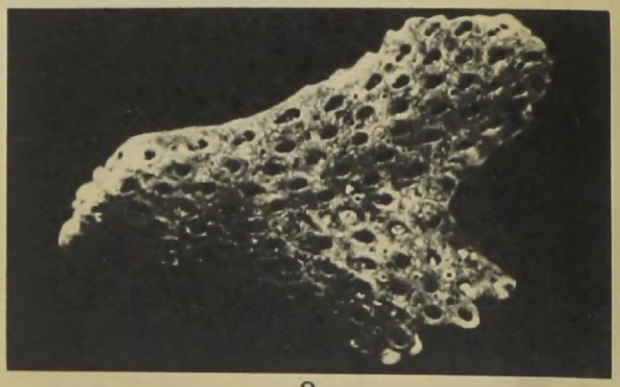

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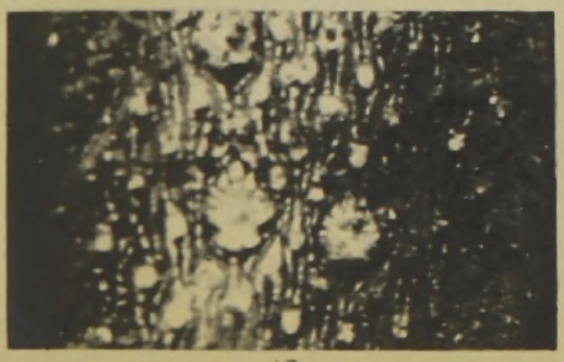

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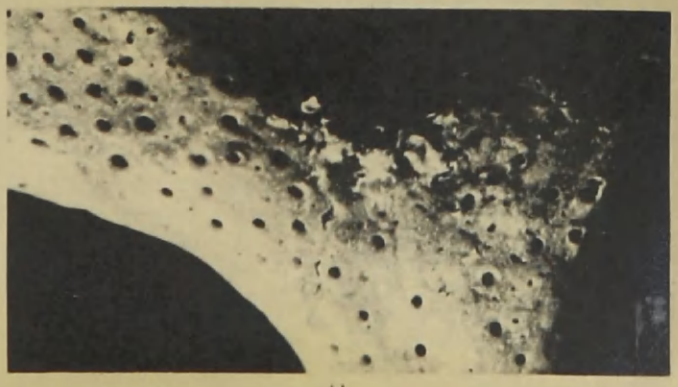

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PLATE X

Plate 11

Figures | Page

1, 3, 5-6, 9. Holoporella cf. H. discus Canu and Bassler, 1920. Collection No. 1434. Locality 4 129

1, 3. Views of the discoid zoarium, x 9.1.

5. Surface of another specimen, x 76, with smooth peristome.

6. Upper side of a zoarium, x 16.

9. Inner side of the same example, x 9.

2, 4. Holoporella rosefieldensis McGuirt, n. sp. Collection No. 1435. Locality 4 130

2. Portion of the massive zoarium, x 13.3, with superficial and deep zooecia.

4. Same specimen, x 63.3, illustrating the aperture, areolae and ovicell.

7-8. Kleidionella sp. Collection No. 1451. Locality 4 137

7. Surface of the bilamellar zoarium, x 70.

8. Fragment of a zoarium, x 13.3.

10-11. Kleidionella grandis Canu and Bassler, 1917. (See Plate IX)..... 136

10. Example of another zoarium, x 4.8.

11. Transverse section of a frond, x 4.1.

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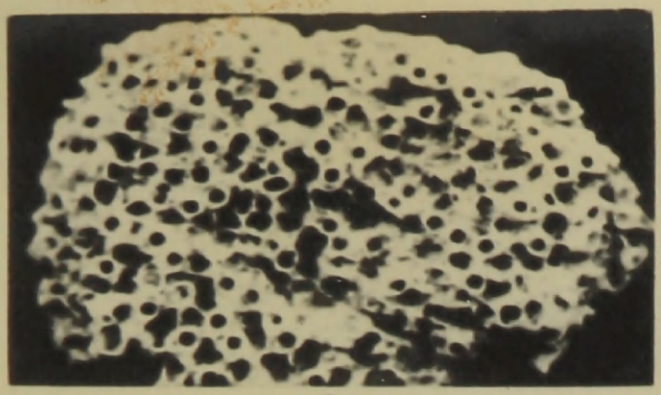

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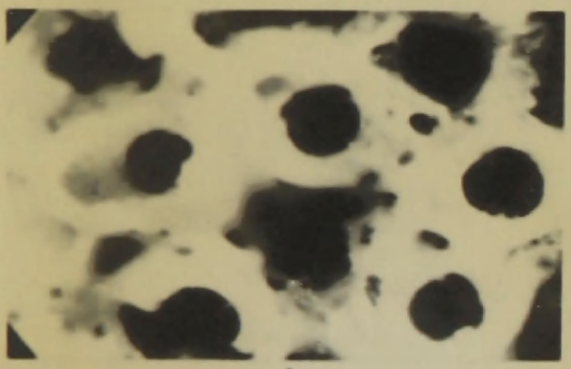

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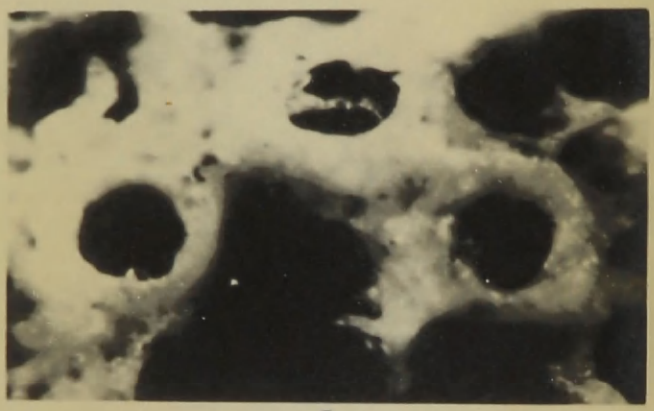

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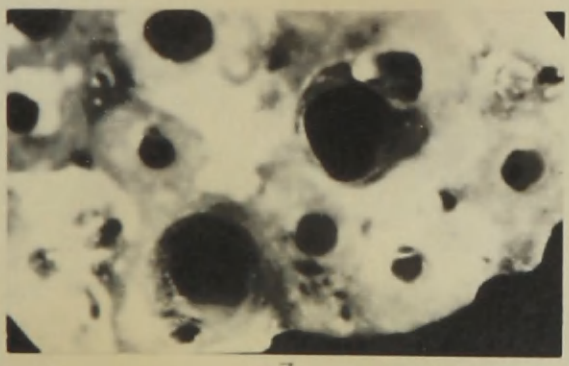

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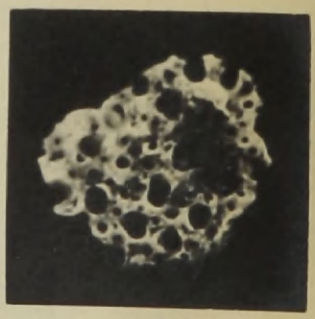

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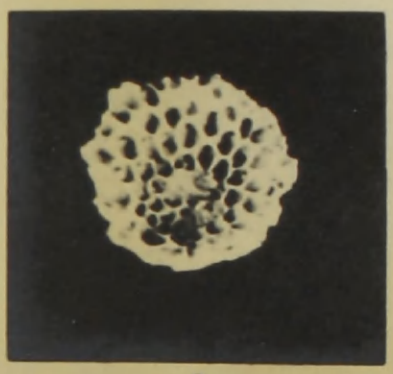

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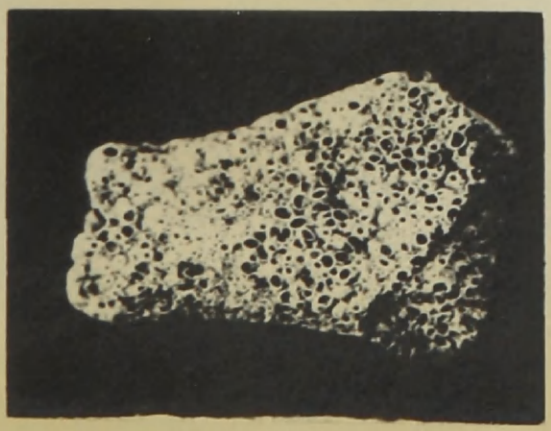

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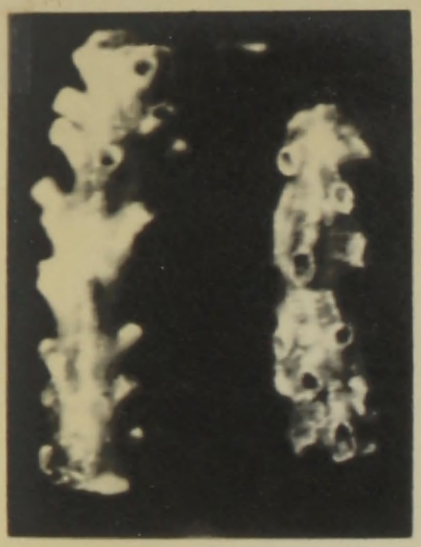
PLATE XI

Plate 12



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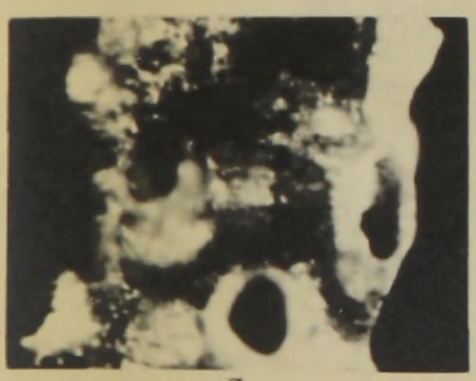

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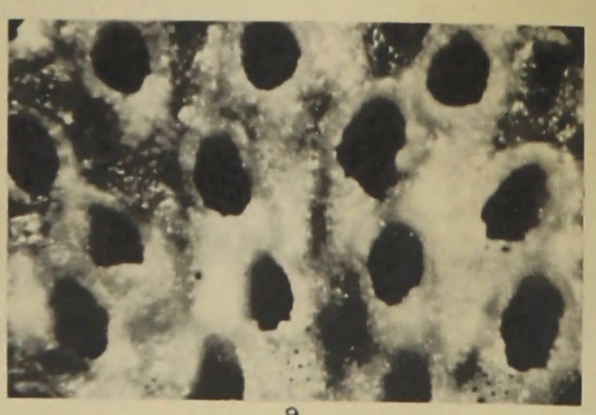

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PLATE XII

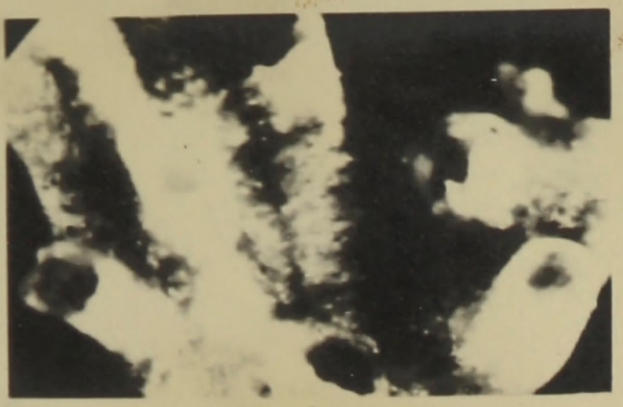
Plate 13

Figures | Page

1-2 *Crisulipora* sp.
Collection No. 1476. Locality 4 147
1. Flabellate zoarium, x 12.7.
2. Same specimen, x 72.2.

3, 5. *Crisulipora* cf. *C. promiers* Canu and Bassler, 1920. (See Plate 30).
Collection No. 1486 148
Examples of the tri-serial segment, x 11.2 and 82.3, respectively.

4, 6-9. *Pleuronea fenestrata* Busk, 1859.
Collection No. 1490 149
4. View of a branch, x 80, with fascicles arranged in definite rows. Locality 14.
6. Dorsal side of a specimen, x 84. Locality 14.
7, 9. Several zoaria, x 12.7 and 3.7, respectively. Locality 14.
8. An older zoarium, x 84, with frontal tregopores. Locality 10.



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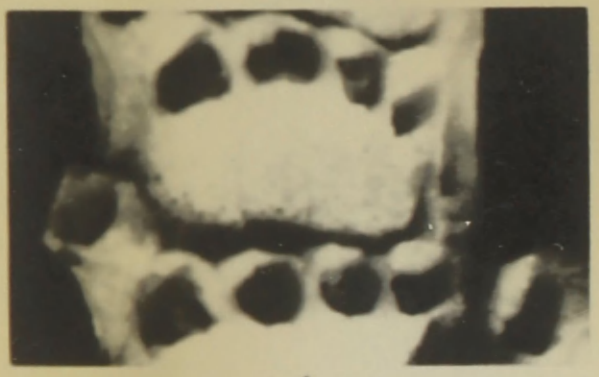

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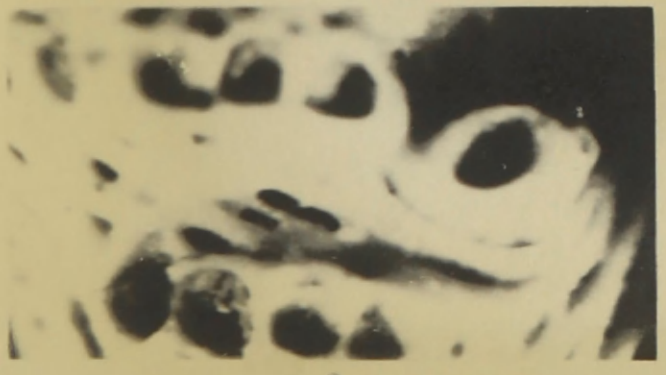

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PLATE XIII

Plate 14

Figures — Page

1, 4. Acanthodesia sp.
Collection No. 1249. Locality 12 43
1. Portion of the incrusting zoarium, x 77, with the flat crystocyst, and the furrows separating the zooecia.
4. Same specimen, x 14, of oriented zooecia.

2, 11. Conopeum hoockeri Haime, 1850.
Collection No. 1200. Locality 12 37
2. The incrusting zoarium, x 7.3.
11. A part of the same specimen, x 76.

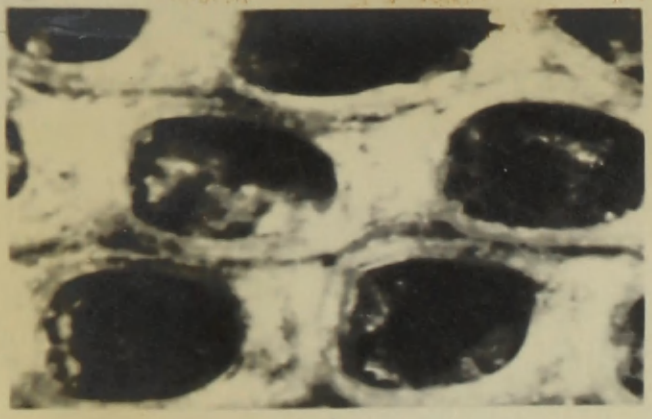
3, 7. Conopeum wilcoxianicum Canu and Bassler, var. ouachitaensis McGuirt, n. var.
Collection No. 1242. Locality 6 40
3. Illustrating the granular, thin, mural rims, x 60.
7. The unilamellar zoarium, x 10.8.

5-6, 9. Conopeum lamellosum Canu and Bassler, 1920.
Collection No. 1241..... 39
5. Example of the multiple lamallae composing the zoarium, x 4.2. Locality 12.
6. Surface of a specimen, x 61, illustrating the mural rim and septulae. Locality 11.
9. Another example of the oriented zooecia, x 12.7. Locality 12.

8, 10. Conopeum sp.

Plate 14-(Continued)

Figures



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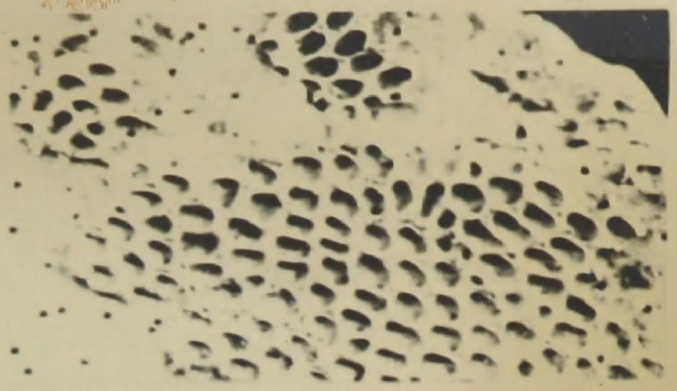

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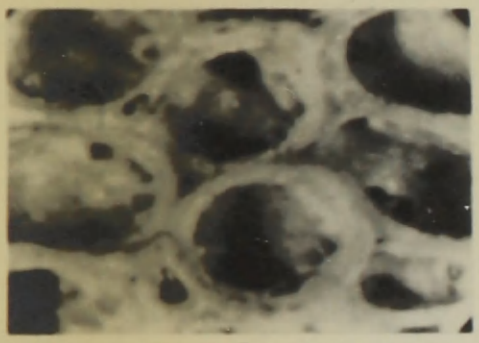

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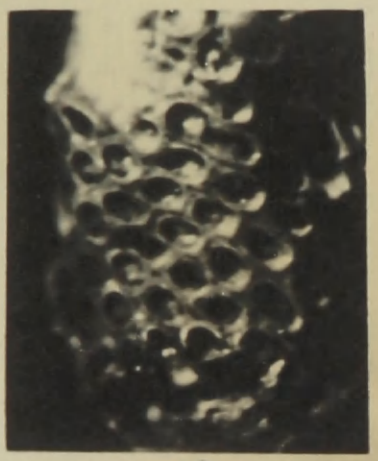

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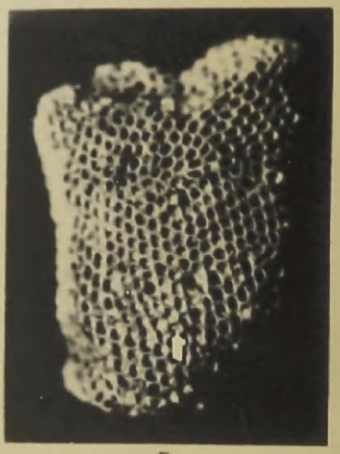

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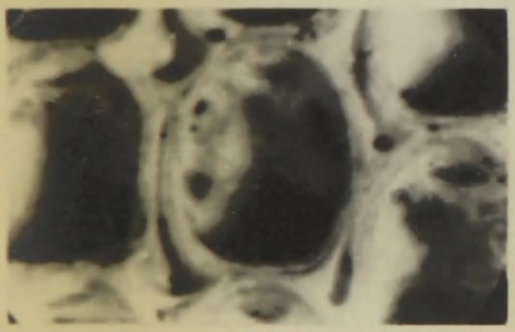

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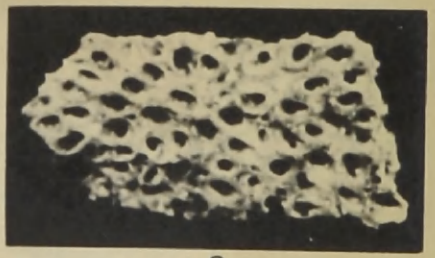

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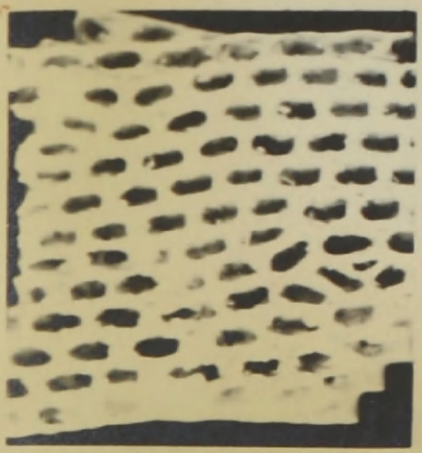

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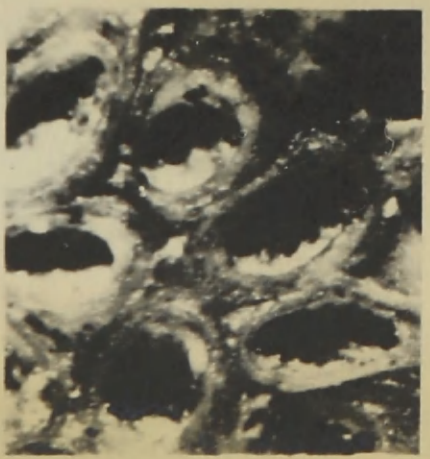

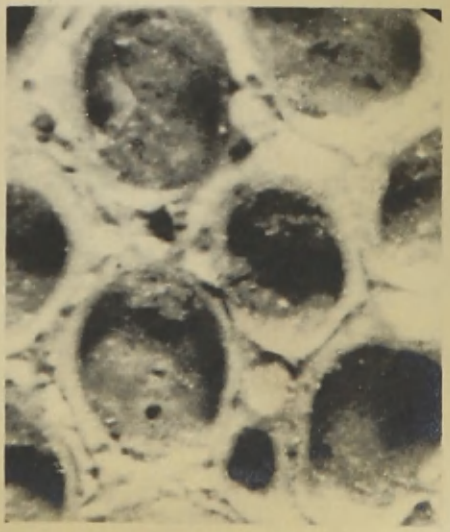

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PLATE XIV

Plate 15

Figures **Page**

1, 5, 7. Otionella tuberosa Canu and Bassler, 1920.
Collection No. 1262. Locality 5 48

1. Inner side of a specimen, x 84.2.
5. Surface of a fragment, x 84.2, with the very large vibraculum.
7. Fragment of a zoarium, x 22.
The position and size of the vibracula are visible.

2, 6, 10. Otionella perforata Canu and Bassler, 1917.
Collection No. 1262. Locality 12 47

2. Numerous pores on the inner face of a zoarium, x 70.
6. Surface of a zoarium, x 70.
10. Portion of a zoarium attached to a coral, x 12. The vibracula and the distal summit of the mural rim are shown clearly.

3-4, 9, 11. Trochopora bouei Lea, 1833.
Collection No. 1265. Locality 12 49

3. Inner side of the discoid zoarium, x 9.5.
4. Upper surface of a complete zoarium, x 9.5.
9. Marginal area of the inner side, x 70.
11. Portion of an example, x 70, with narrow vibracula.

8. Trochopora truncata De Gregorio, 1890.
Collection No. 1266. Locality 12 50

Plate 15-(Continued)

Figures Page

Two complete zoaria, x 8.8, illustrating the upper and lower surfaces.

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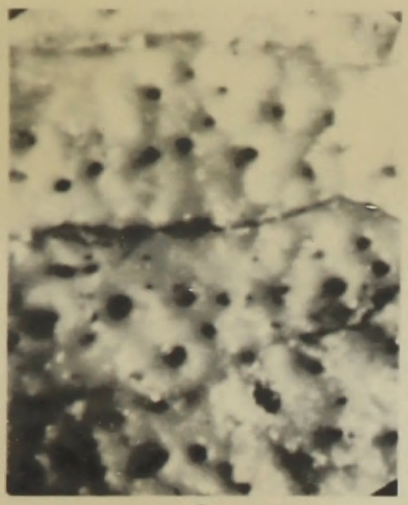

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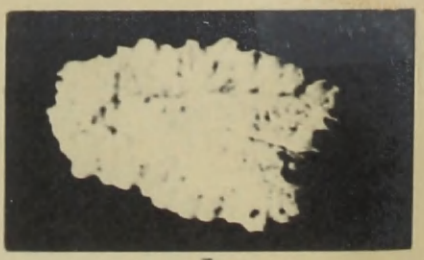

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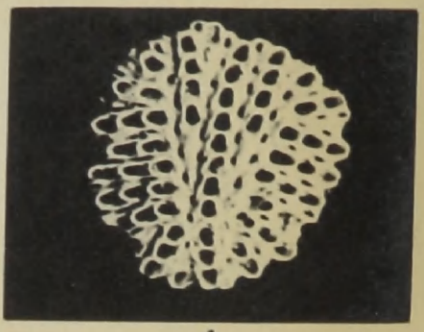

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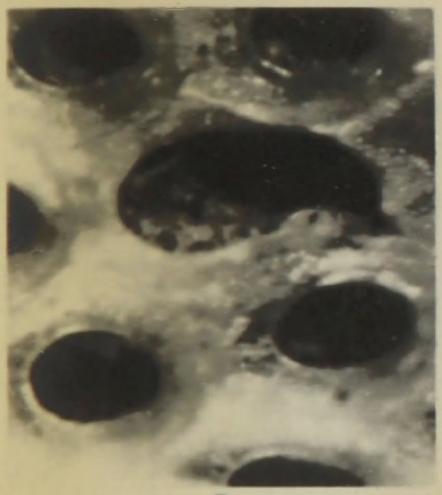

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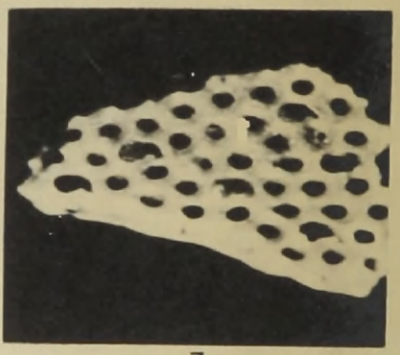

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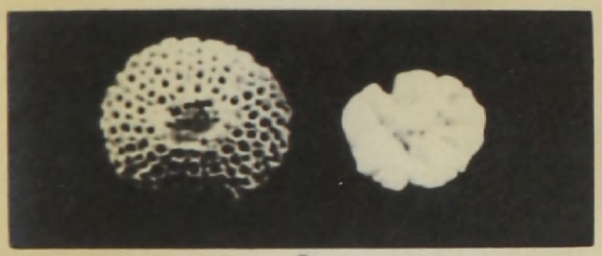

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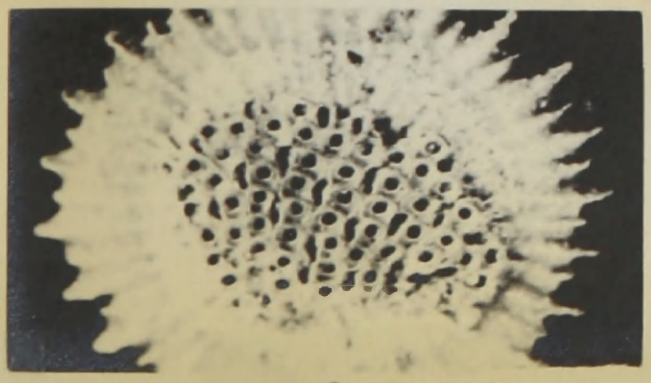

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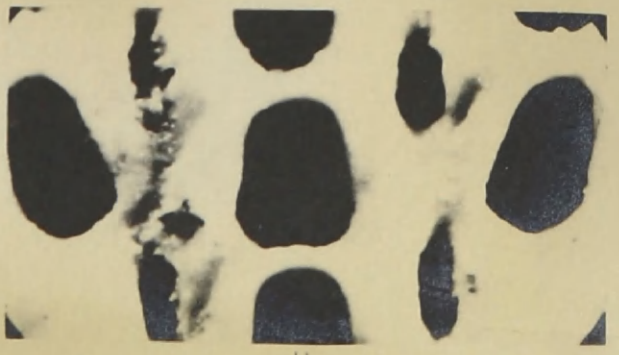

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PLATE XV

Plate 16

Figures | Page

1, 4. *Vibracellina montgomeryensis* McGuirt, n. sp. Collection No. 1270. Locality 12 51

1. Examples of the incrusting zoarium, x 4.1.

4. Photograph of some zooecia, x 70, with the constant vibracula.

2, 5. *Amphiblestrum rectum* Canu and Bassler, 1920. Collection No. 1275. Locality 12 53

2. Specimen, x 44, with normal and partially closed zooecia, and small avicularia.

5. The incrusting zoarium, x 10.8.

3, 9-10. *Amphiblestrum chawneri* McGuirt, n. sp. Collection No. 1274. Locality 12 52

3. Portion of a specimen, x 70, illustrating the narrow opesium, wide rims, and small avicularia.

9, 10. The incrusting zoaria, x 14.6 and 4.8, respectively.

6, 8. *Callopora montgomeryensis* McGuirt, n. sp. Collection No. 1280. Locality 12..... 55

6. The incrusting specimen, x 13.3.

8. Portion of same specimen, x 77, with symmetrical avicularia.

7, 11. *Callopora filoparietis* Canu and Bassler, *var. montgomeryensis* McGuirt, n. sp.

Plate 16-(Continued)

Figures

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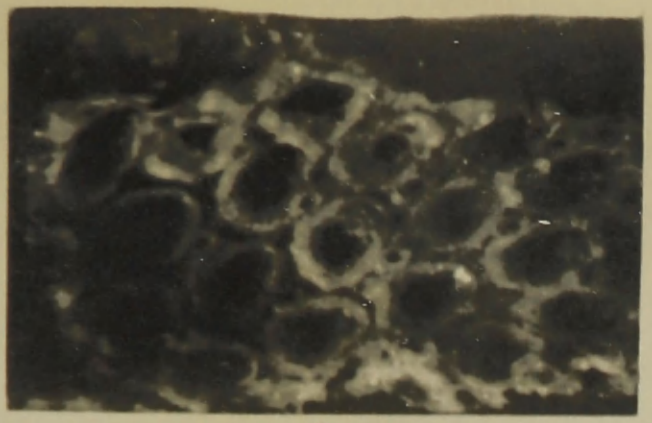

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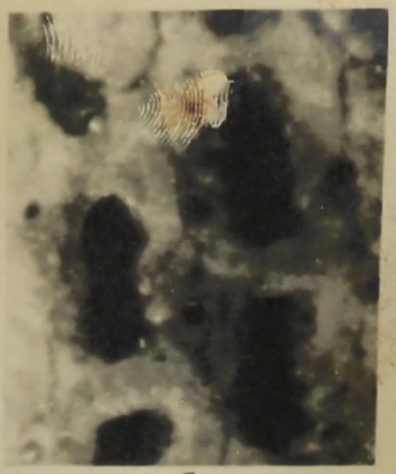

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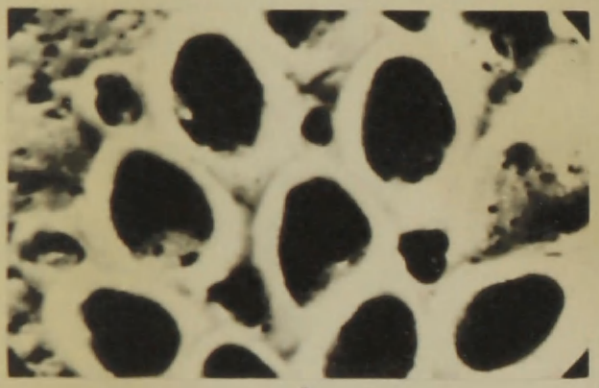

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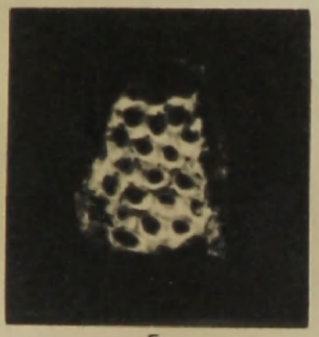

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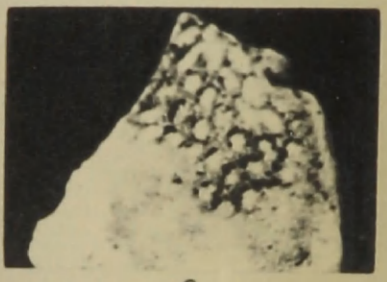

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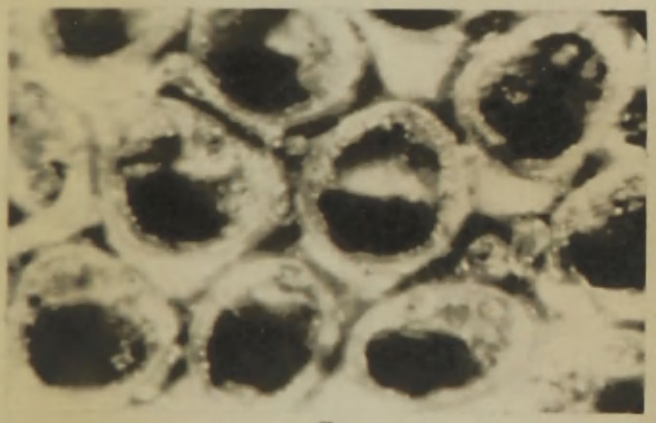

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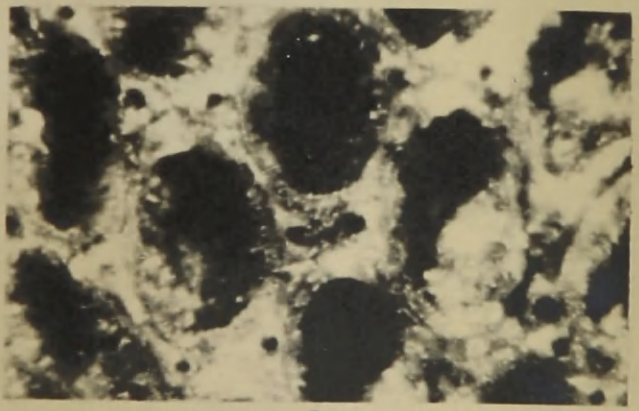

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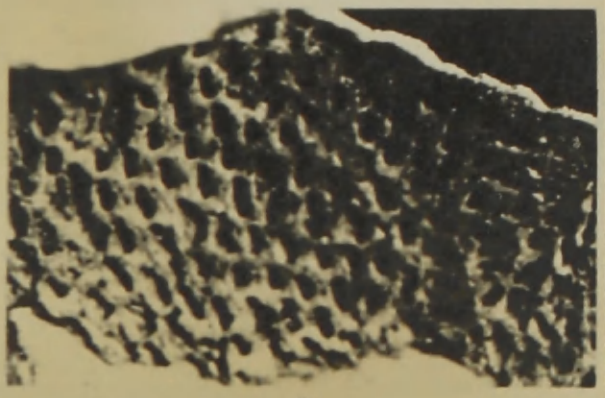

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PLATE XVI

Plate 17

Figures — Page

1-2, 9. Reptolunulites bassleri McGuirt, n. sp.
Collection No. 1306. Locality 12 69

1. Surface of a fragment, x 13.3.

2. A zooecium, x 81, with crenulated rim. The short condyles of the vibracula are visible.

9. Lower surface, x 81, with perforations.

3, 11. Reptolunulites jacksonensis Canu and Bassler, 1920.
Collection No. 1300. Locality 12 62

3. Complete zoarium, x 13.3.

11. Ancestrula of another specimen, x 82.3, illustrating open and closed zooecia.

4, 6-7, 8. Reptolunulites bassleri var. montgomeryensis McGuirt, n. var.
Collection No. 1307. Locality 12 70

4. Example, x 72.8, showing the penduriform, short opesium.

6-7. Fragments of the flat zoarium, x 4.8 and 2.5, respectively.

8. Inner face of a specimen, x 72.8.

5. Stamenocella anatina Canu and Bassler, 1920.
Collection No. 1293. Locality 8 59
Fragment, x 57, picturing the large, duck-bill-shaped avicularium.

Plate 17-(Continued)

Figures

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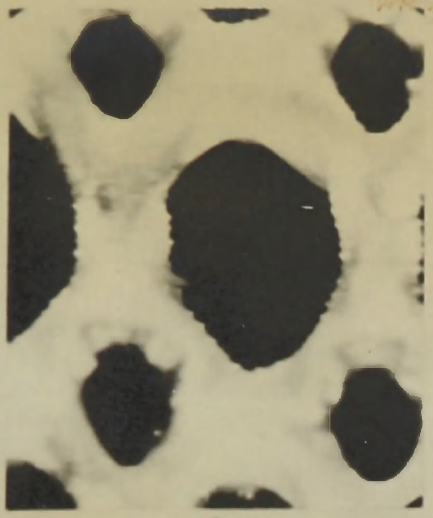

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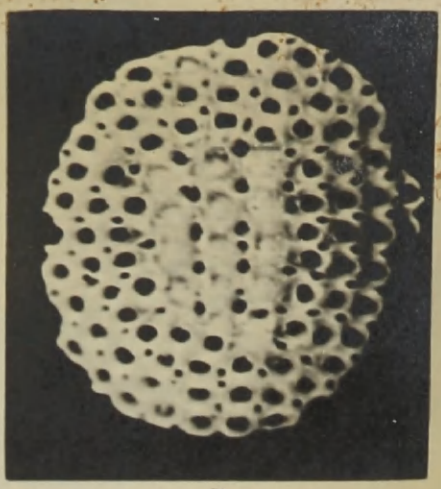

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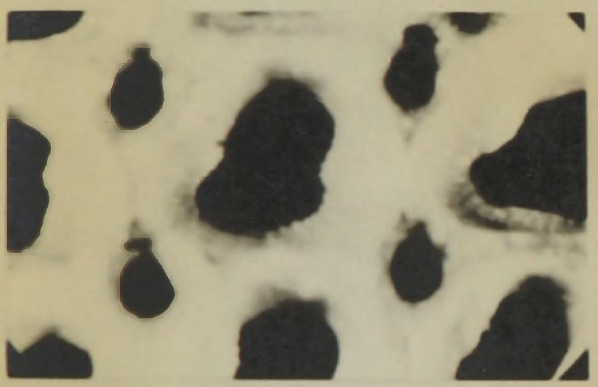

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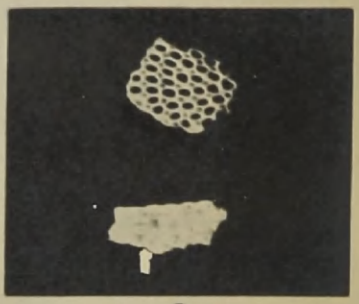

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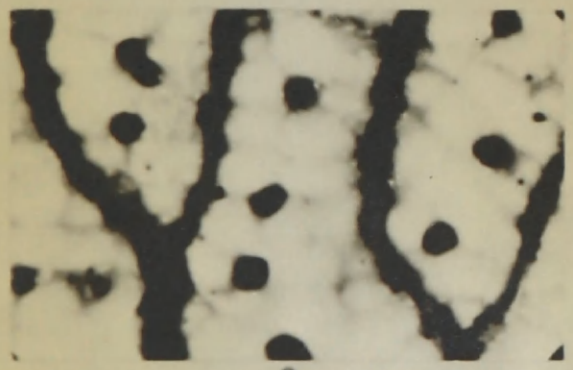

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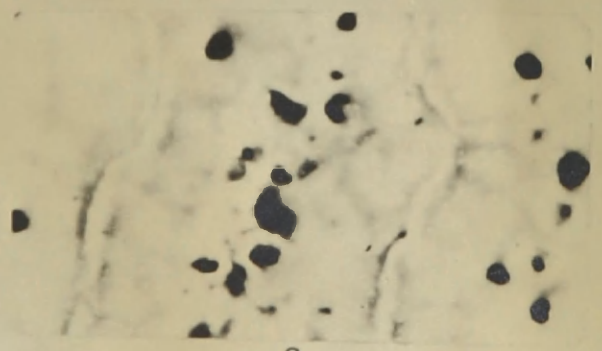

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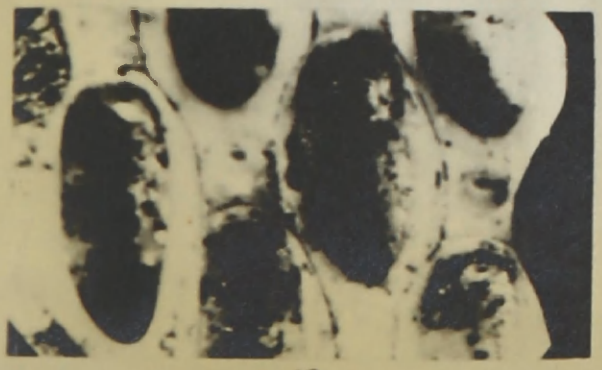

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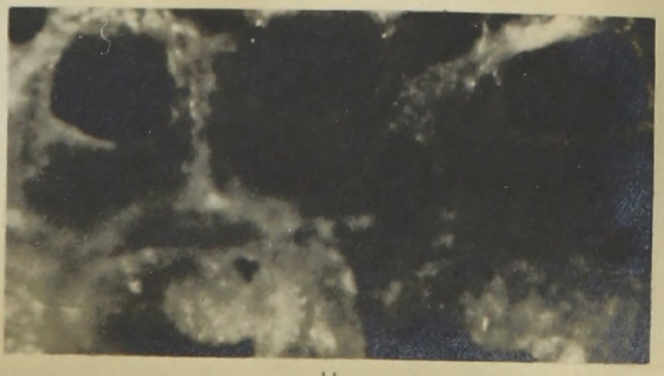

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PLATE XVII

Plate 18

Figures **Page**

1. Reptolunulites ligulata Canu and Bassler, 1920. (See Plate 7). Locality 12 65
   A complete zoarium, x 13.3.

2-3. Floridinella sp.
   Collection No. 1303. Locality 14 72

2. Surface of the unilamellar, x 70, showing the opesium.

3. Same specimen, x 12.7.

4, 6. Onychocella celsa Canu and Bassler, var. montgomeryensis McGuirt, n. var.
   Collection No. 1311. Locality 12 71

4. Variations in size of the zooecia are visible on the incrusting specimen, x 13.3.

6. Portion of same specimen, x 63.3, illustrating the long, granular cryptocyst.

5, 8. Trypostega venusta Norman, 1894.
   Collection No. 1345..... 85

5. Perforated surface of the incrusting zoarium, x 70, with the zooeciules. Locality 12.

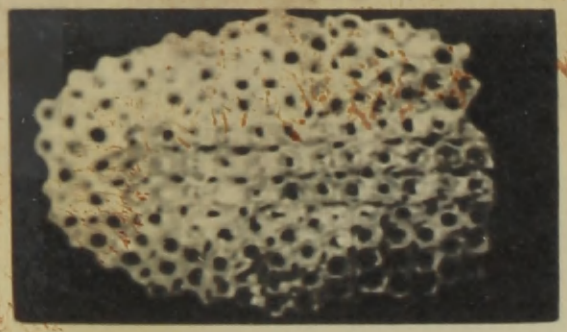
8. Another specimen, x 78, with some of the zooeciules much longer. Locality 9.

7, 10. Gigantopora grandviewensis McGuirt, n. sp.
   Collection No. 1348. Locality 7 86

7. Fragment of the bilamellar specimen, x 13.3.

Plate 18-(Continued)

Figures		Page
	10. The same zoarium, x 79, illustrating the peristomial avicularia and spiramen.	
9, 11.	Ochetosella jacksonica Canu and Bassler, 1917. Collection No. 1351. (See Plate 19)	87
	9. View of an old, cylindrical zoarium, x 13.3. Locality 8.	
	11. Another specimen, x 76, showing the deep aperture and the areolae. Locality 12.	



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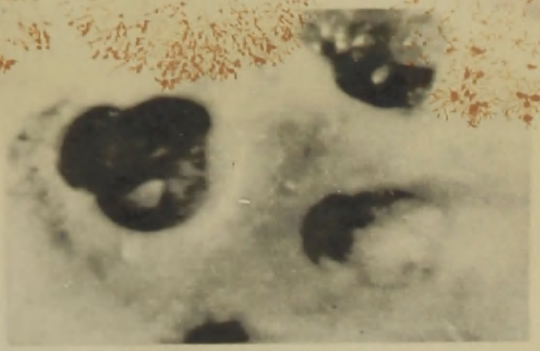

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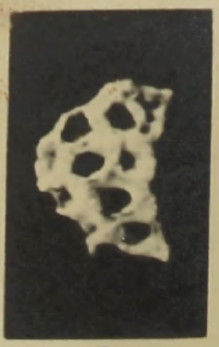

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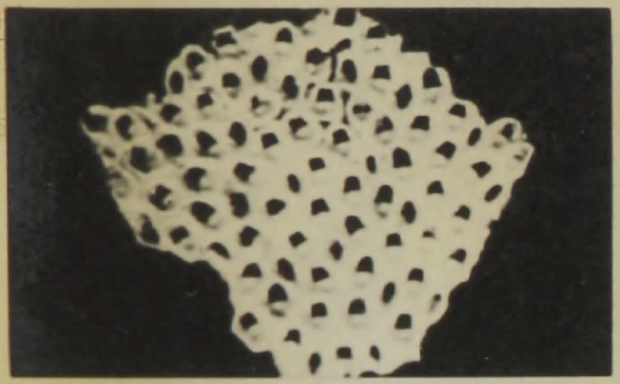

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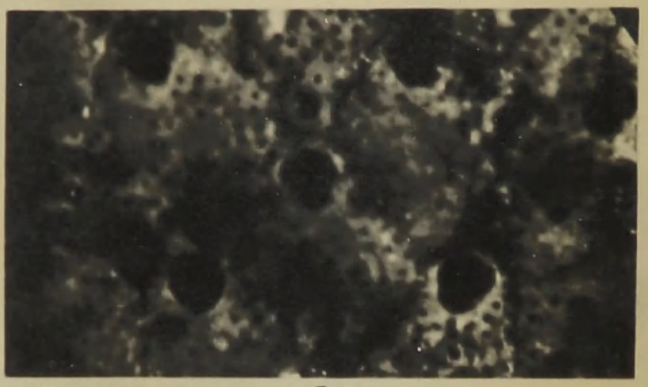

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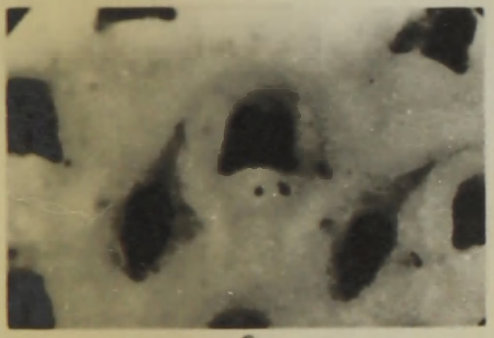

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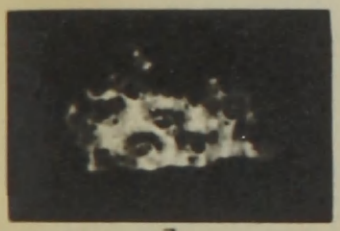

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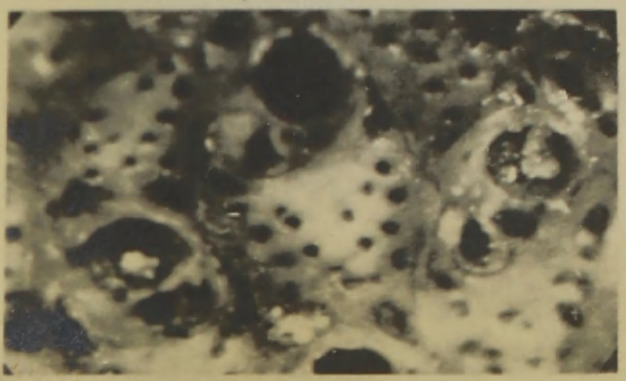

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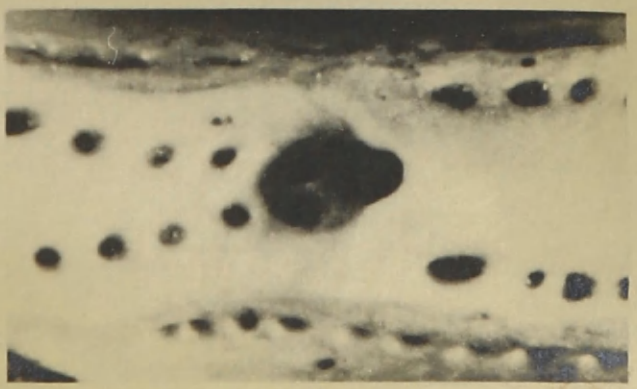

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PLATE XVIII

Plate 19

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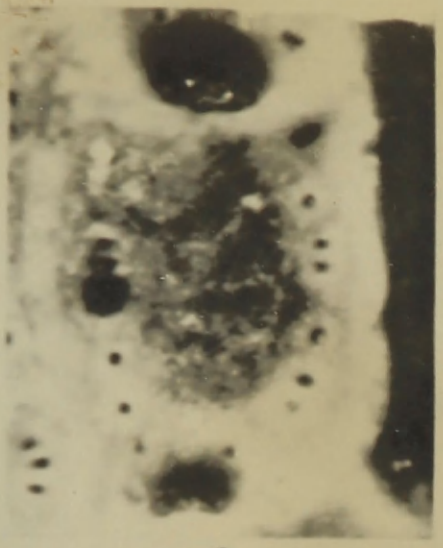

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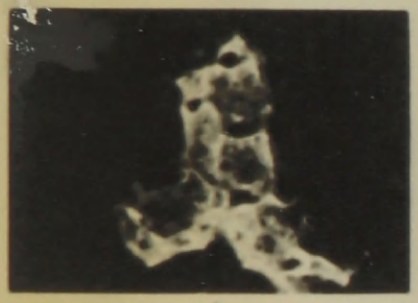

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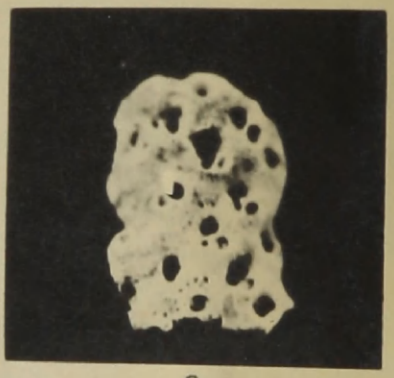

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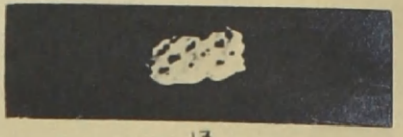

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PLATE XIX

Plate 20

Figures — Page

1. *Schizoporella* sp.
Collection No. 1370. Locality 10 94
The incrusting zoarium of oriented zooecia, x 13.3.

2-5. *Bactridium heisonensis* McGuirt, n. sp.
Collection No. 1373 95

2. Portion of a zoarium, x 78, illustrating the frontal of the convex zooecia, and the peristome. Locality 6.

3-5. Views of the cylindrical zoarium, x 13.3. Locality 10.

6, 9. *Hippomenella fiski* McGuirt, n. sp.
Collection No. 1375. Locality 12 96

6. The fragile, incrusting zoarium, x 14.6.

9. Same specimen, x 79, with perforated ovicell.

7-8, 10-12. *Hippomenella incondita* Canu and Bassler, 1920. Collection No. 1377. Locality 6... 98

7. Zooecia, x 41.5, having areolae, avicularia, and protuberances into the aperture.

8. Ovicelled zooecium, x 41.5, with one spine visible on each side of the aperture.

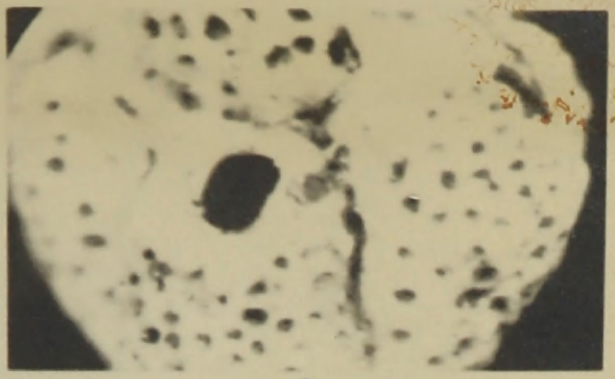
10. Fragment of the bilamellar zoarium, x 13.3, showing a broken ovicell.

11-12. Interior view of the frontal, x 41.5 and

Plate 20-(Continued)

Figures Page

13.3, respectively.



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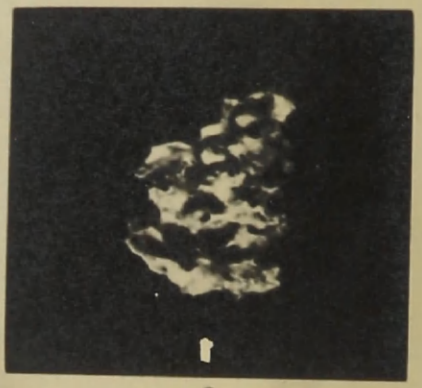

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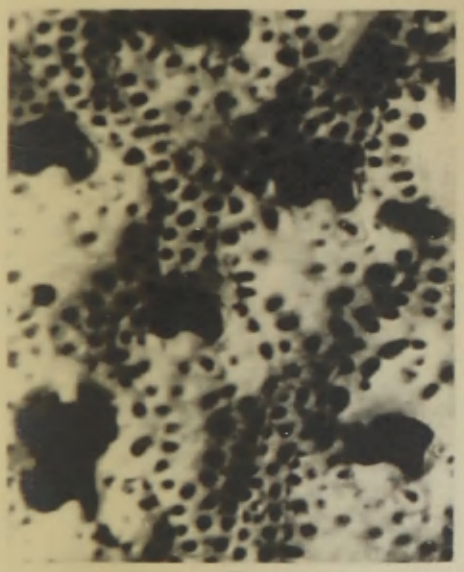

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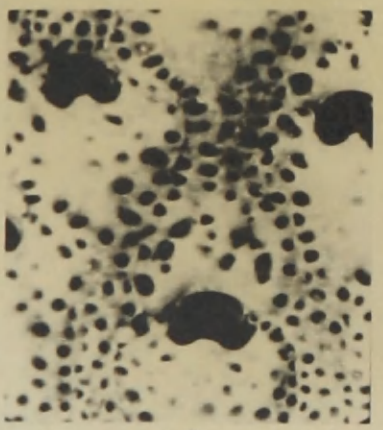

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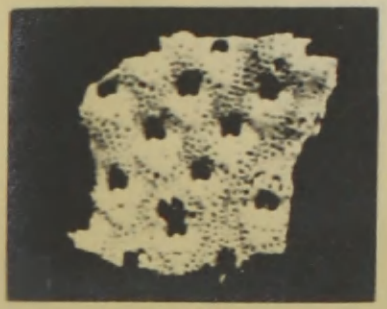

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PLATE XX

Plate 21

Figures — Page

1-2. Hippomenella transversora Canu and Bassler, 1920. Collection No. 1376. Locality 6 97

1. Surface of the unilamellar zoarium, x 58, with the mucra, triangular areolae, and transverse aperture.

2. Same specimen, x 13.1.

3, 6. Hippomenella radicata Canu and Bassler, 1920. Collection No. 1379. Locality 14 100

3. Part of the unilamellar zoarium, x 13.3.

6. Same specimen, x 66, with broken ovicell, avicularia, and spines on the peristome.

4-5, 7, 9. Hippomenella rotula Canu and Bassler, 1920. Collection No. 1378. Locality 12 99

4, 7. Surface of the bilamellar zoarium, x 13.1.

5. Avicularium, aperture with a spine on each side, ovicell and areolae on a specimen, x 59.

9. View of the frontal from the interior, x 13.1.

8, 10-12. Smittina angulata Reuss, 1920. Collection No. 1383. Locality 12 101

8. Inner view of a broken branch, x 4.2.

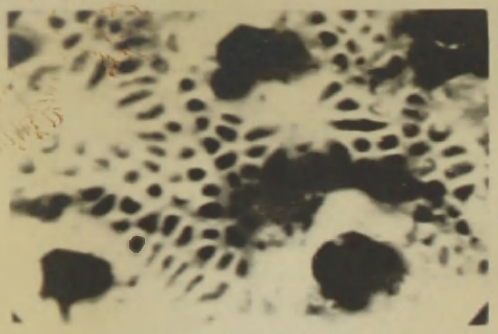
10. Surface of the massive zoarium, x 13.3.

11. A fragment, x 4.2.

Plate 21-(Continued)

Figures Page

12. Lyrula, porous frontal, and peristomial avicularia, x 59.



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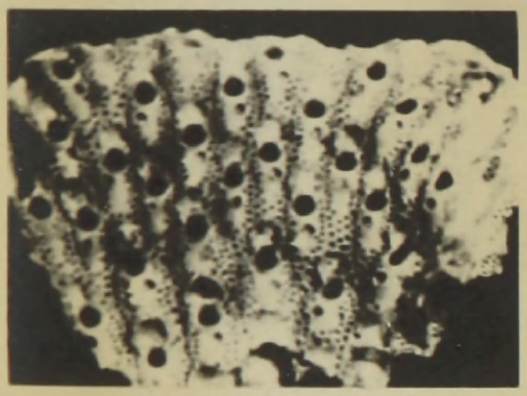

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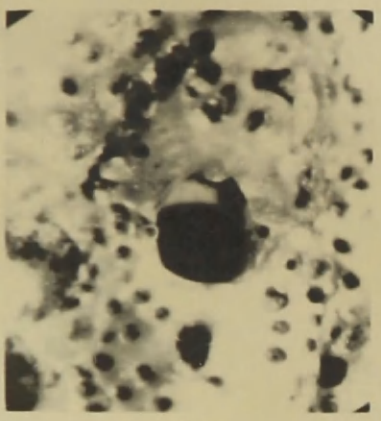

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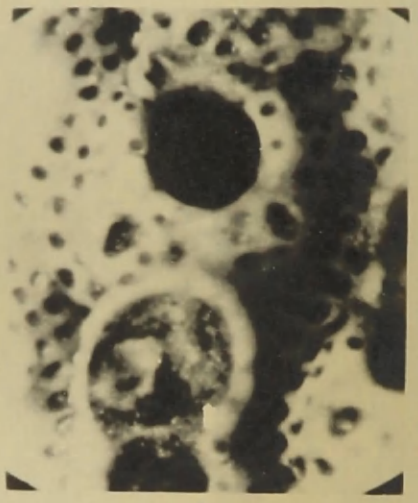

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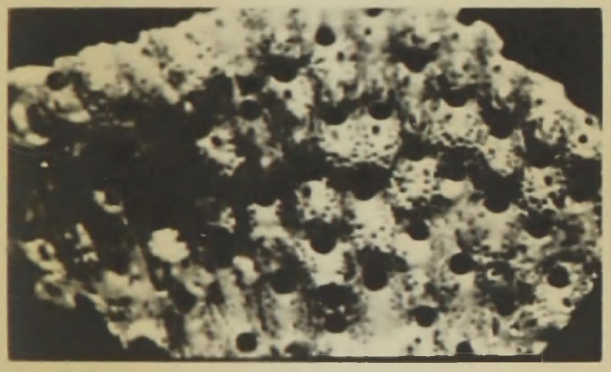

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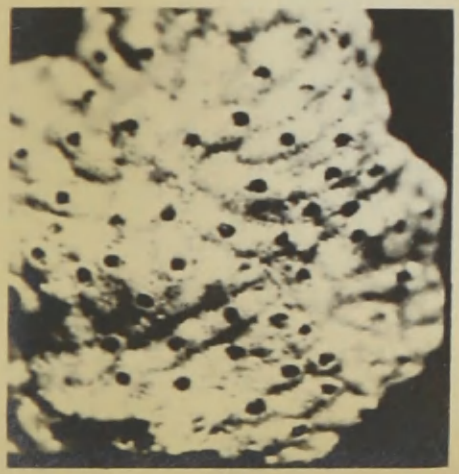

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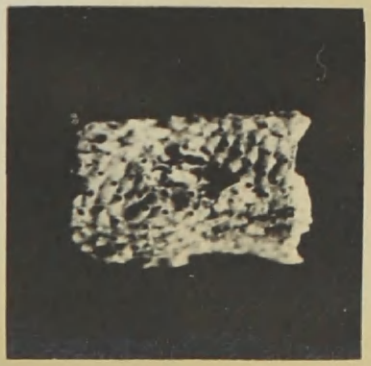

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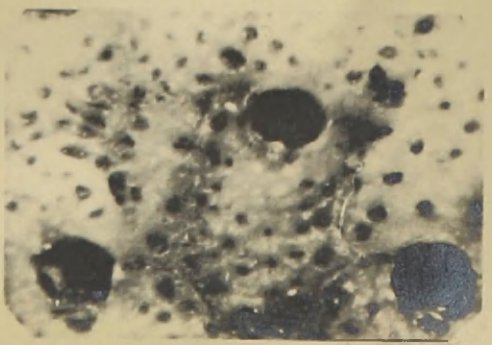

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PLATE XXI

Plate 22

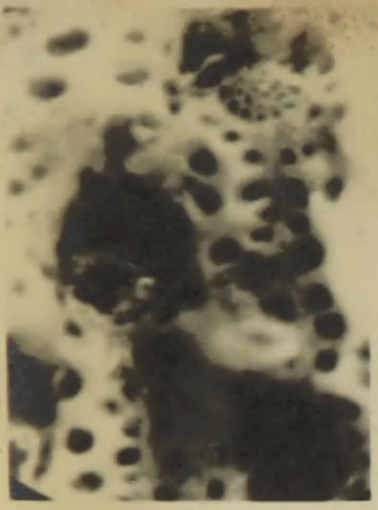
Figures — Page

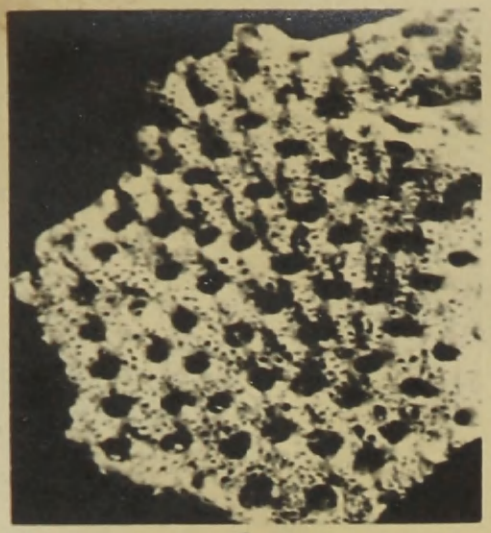
1-2, 4, 6-11. Porella denticulifera Canu and Bassler, 1920. (See Plate 23). Collection No. 1394 108

1. One aspect of a zoarium, x 76 (reversed). Locality 14.
2. A portion of the bilamellar zoarium, x 13.3, with large tremopores. Locality 12.
4. Fragments of the species, x 4.8. Locality 12.
6. Specimen, x 13.3, illustrating the prominent median avicularium. Locality 8.
7. Median avicularium transformed into an elongate slit, x 13.3. Locality 8.
8. Specimens, x 4.8. Locality 8.
9. Perforate ovicells, x 67. Locality 8.
10. Another specimen, x 13.3. Locality 8.
11. Same specimen, x 78, showing the avicularium.

3, 5. Porella montgomeryensis McGuirt, n. sp. Collection No. 1390. Locality 12 104

3. Surface of the incrusting zoarium, x 13.3.
5. Same specimen, x 82.3, with the oval and perforated ovicell, and the avicularium.





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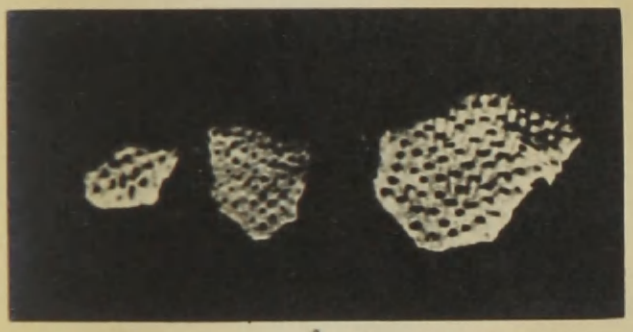

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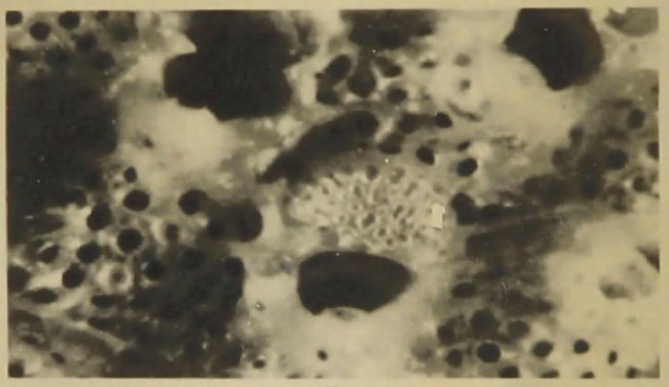

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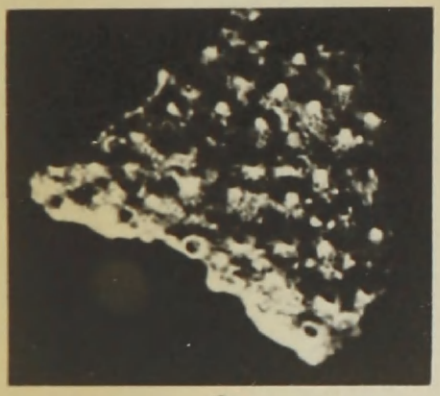

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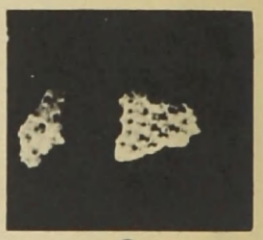

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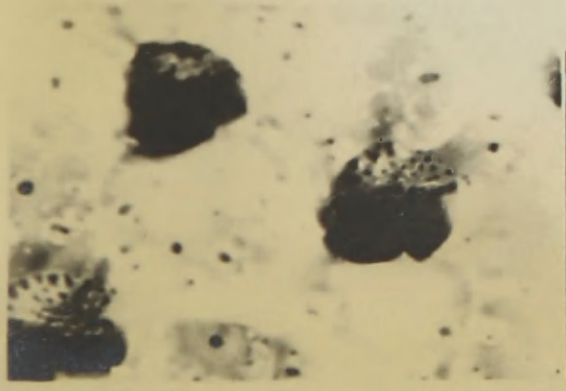

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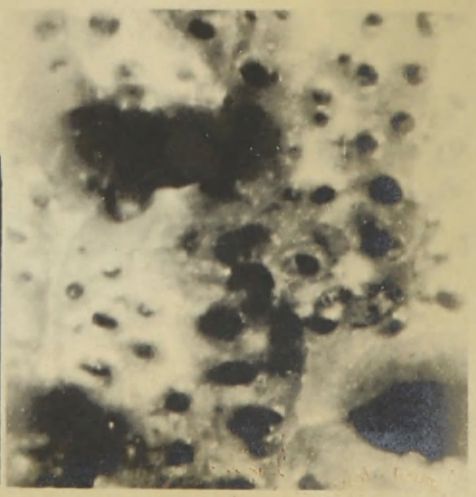

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PLATE XXII

Plate 23

Figures | | Page

1-2. Porella denticulifera (See Plate 22)..... 108

1. Elongate avicularia of another specimen, x 78.

2. Protruding avicularia and broken ovicells of a fragment, x 78. Locality 12.

3-5. Porella jacksonica Canu and Bassler, 1920. Collection No. 1395. Locality 12 109

Views of the bilamellar fronds, x 13.3.

6, 8-9, 12. Porella coronata Canu and Bassler, var. moodysbranchiensis McGuirt, n. var. Collection No. 1392. Locality 12 106

6. View of the interior, x 63.3, showing the perforations and the small cardelles.

8. A specimen, x 63.3, with flat frontal and embedded ovicells.

9. Zoarium, x 13.3.

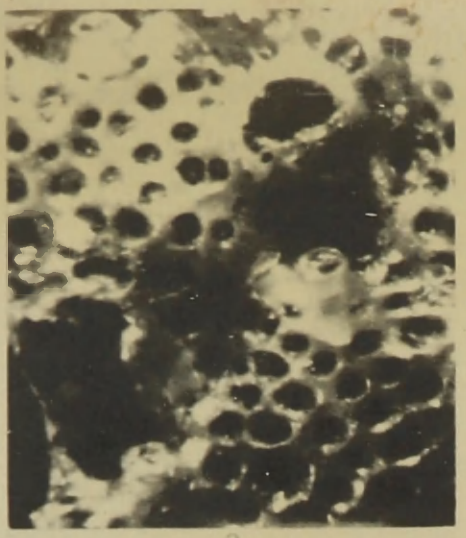
12. Peristomial avicularia of same zoarium, x 78.

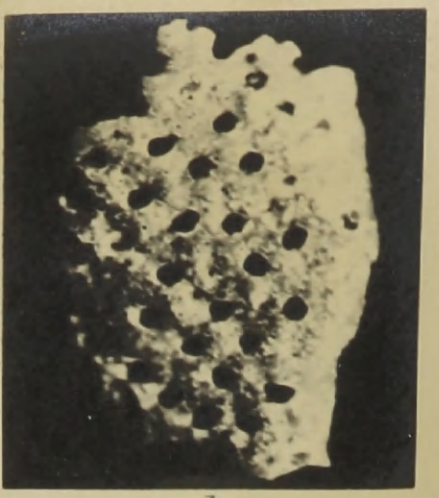
7, 10-11. Porella ouachitaensis McGuirt, n. sp. Collection No. 1391. Locality 6 105

7. Interior of the incrusting zoarium, x 63.3, illustrating the lyrula.

10. Zoarium, x 13.3.

11. Same example, x 63.3, showing the ovicell, rimule, avicularia with pivot, and numerous tremopores.





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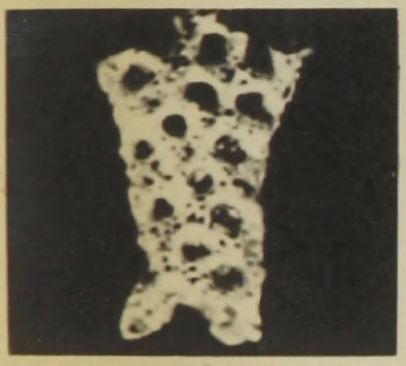

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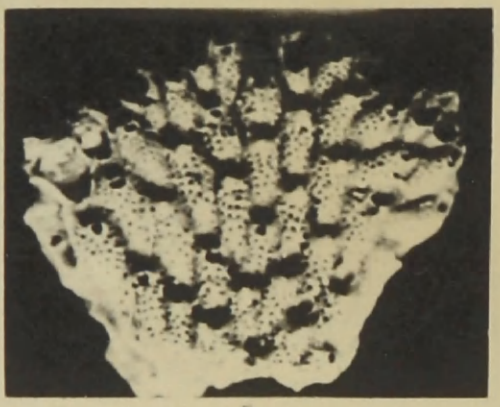

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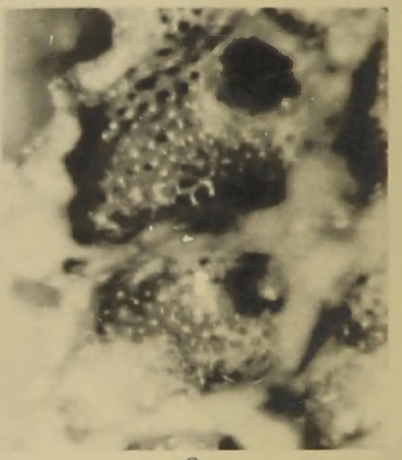

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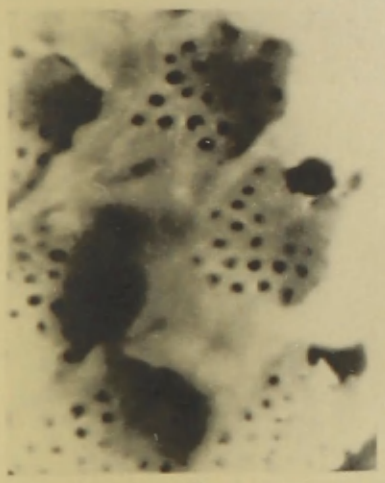

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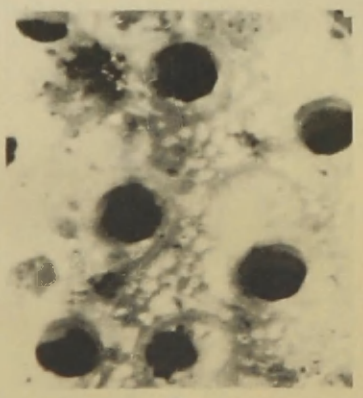

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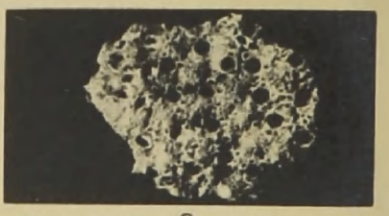

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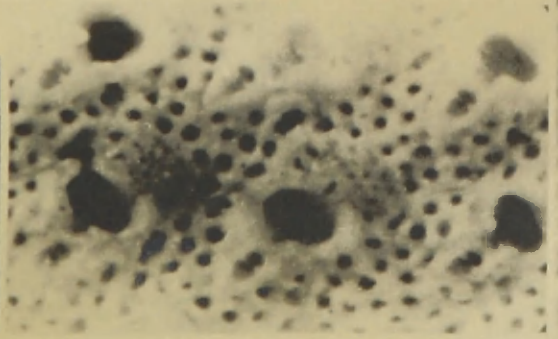

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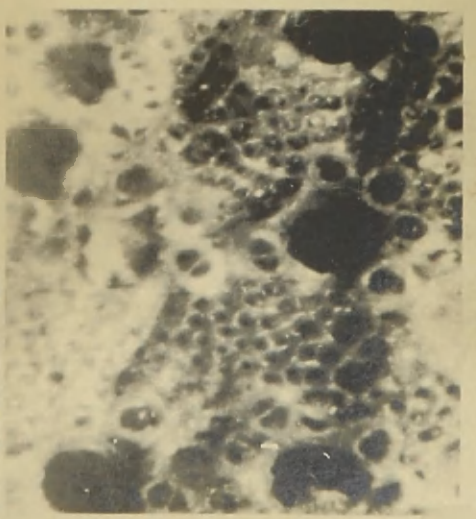

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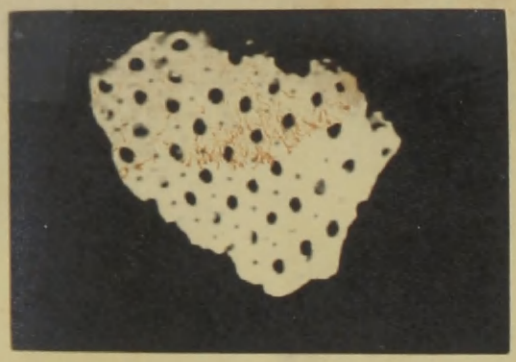
PLATE XXIII

Plate 24

Figures

Plate 24-(Continued)

Figures



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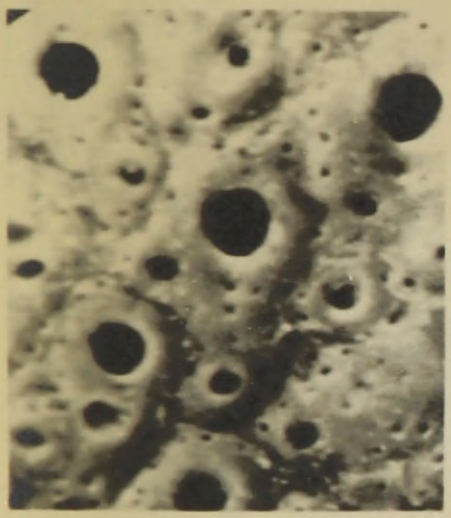

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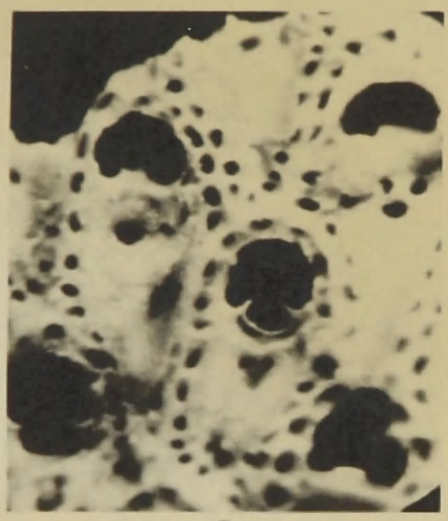

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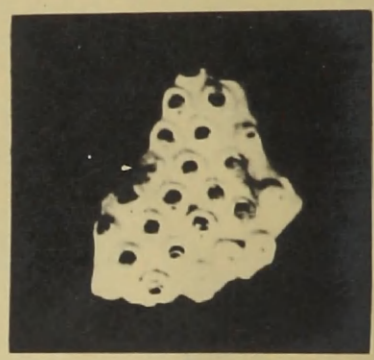

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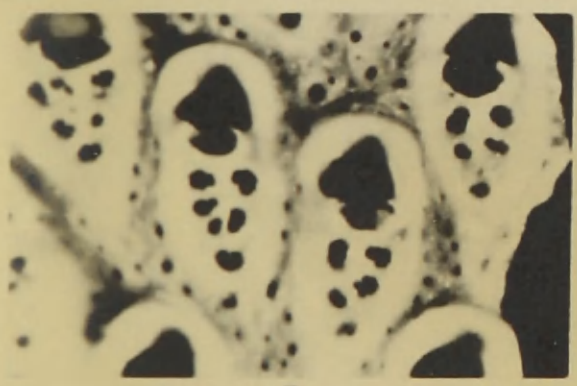

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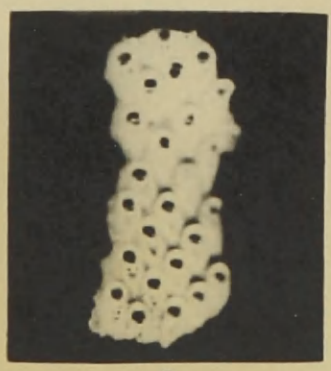

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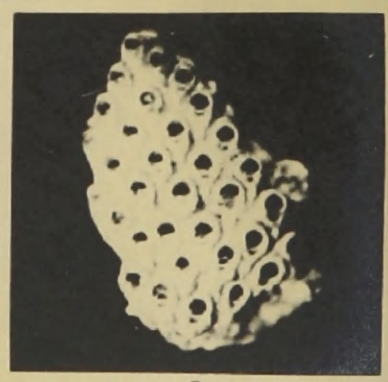

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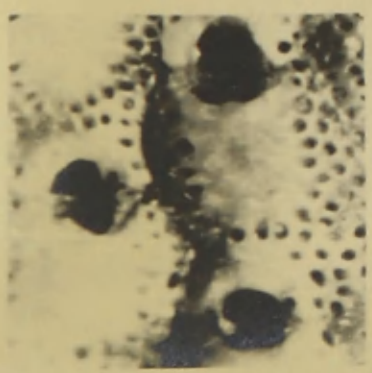

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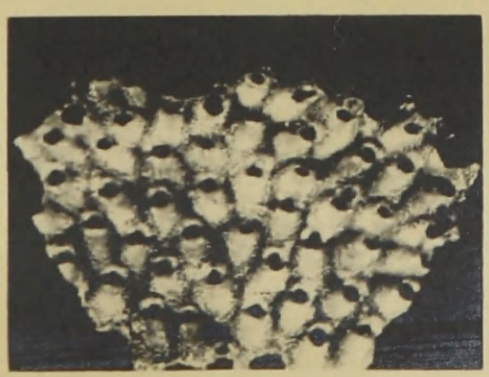

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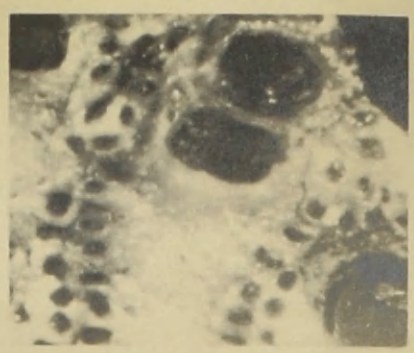

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PLATE XXIV

Plate 25

Figures — Page

1-2. Perigastrella oscitans (See Plate 24) 125

1. Large zooecia of the zoarium, x 13.3.

2. Illustrating spines on the peristome and the single row of areolae, x 76.

3, 5. Phylactella parvicellum Canu and Bassler, 1920. Collection No. 1430. Locality 10.. 127

3. Three incrusting zooecia, x 12.7.

5. Zooecium, x 83, illustrating granular frontal, small aperture with distal tongue.

4, 6-9, 11-12. Holoporella montgomeryensis McGuirt, n. sp. Collection No. 1438. Locality 12 133

4. Marginal zooecia of a young zoarium, x 14.6.

6. Large avicularia and scattered pores of the same specimen, x 88.

7. Under side of the massive zoarium, x 14.6.

8. Upper surface of same fragment, x 14.6.

9. Superficial and deep zooecia of the cumulate zoarium, x 13.3.

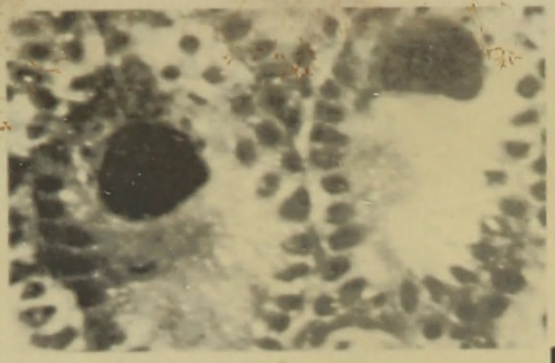
11. Another specimen, x 13.3.

12. Portion of (fig. 8), x 82.3, with deep and superificial zooecia.

10. Holoporella granulosa Canu and Bassler, 1920. (See Plate 26). Collection No. 1433. Locality 12 128

Example of the globular zoarium, x 9.2.

1



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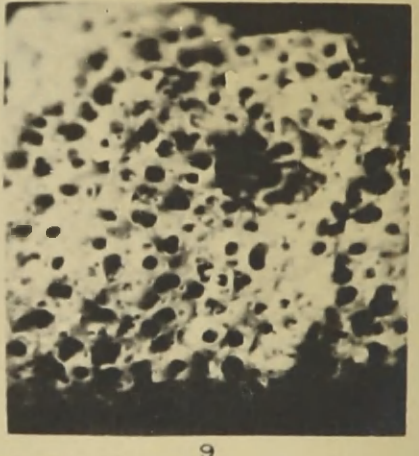

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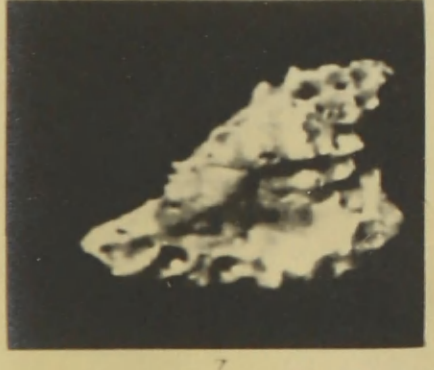

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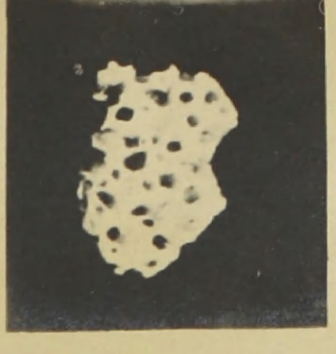

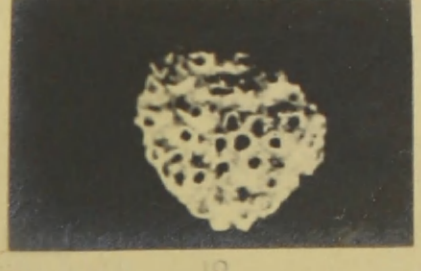

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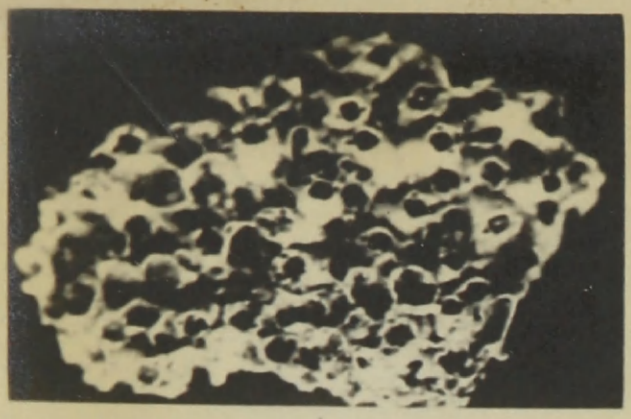
PLATE XXV

Plate 26



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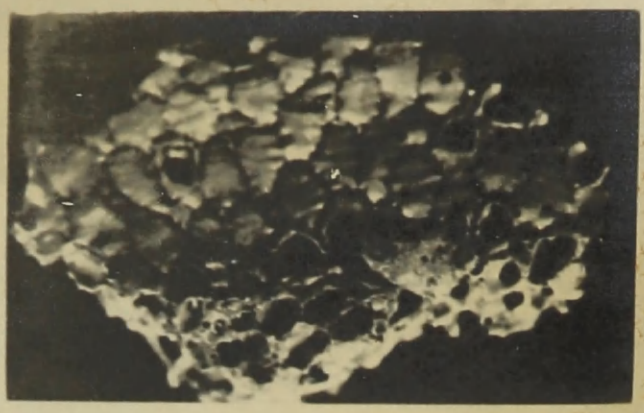

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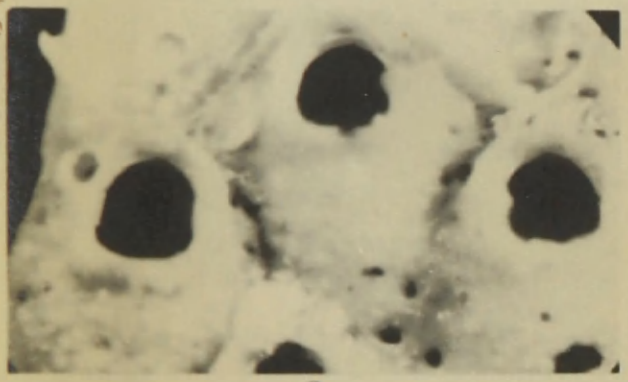

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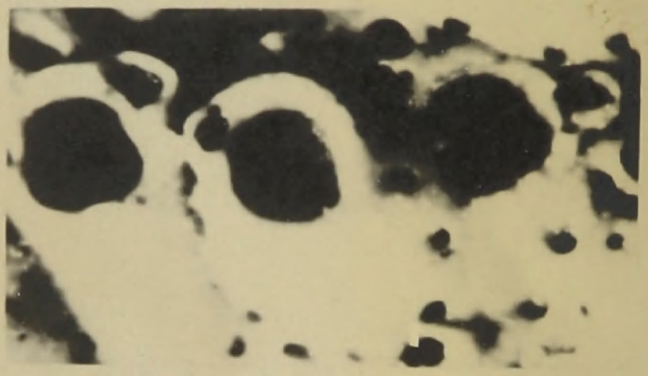

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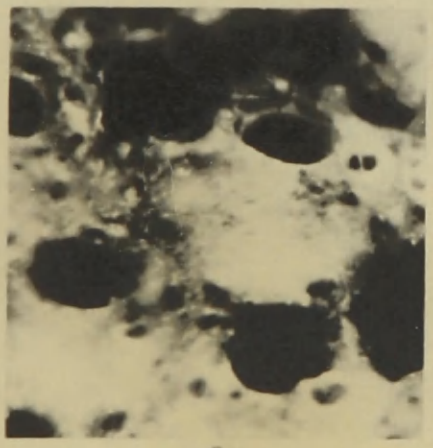

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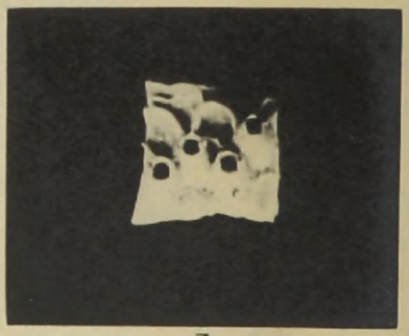

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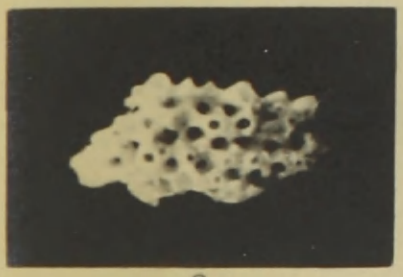

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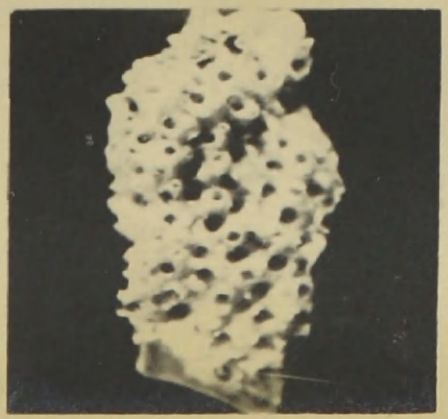

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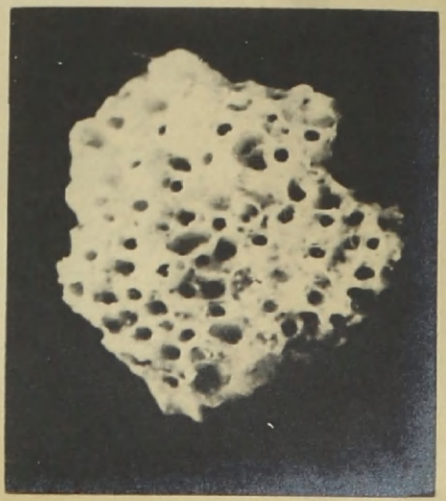

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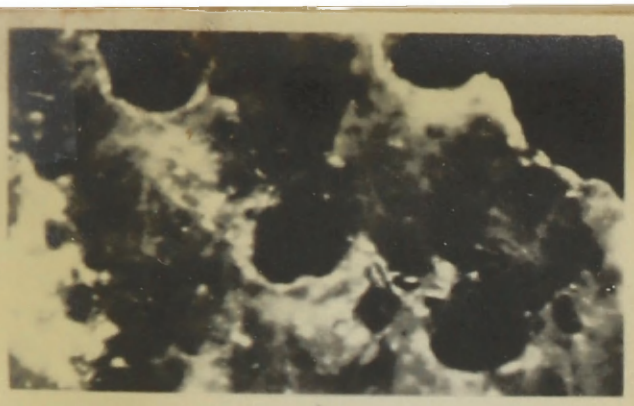

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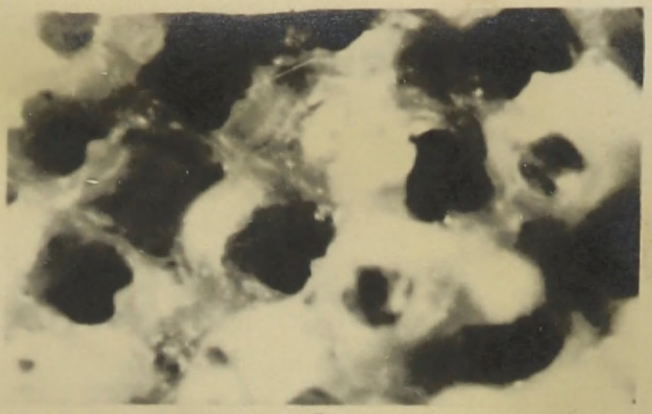

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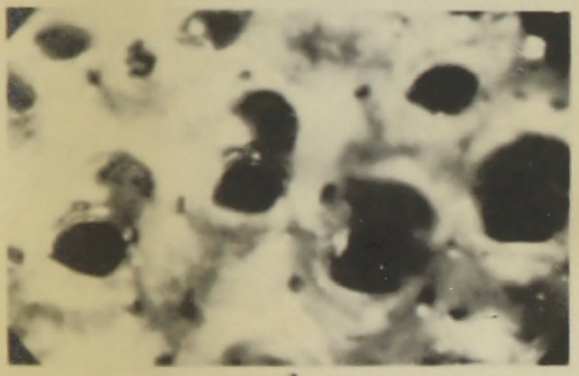

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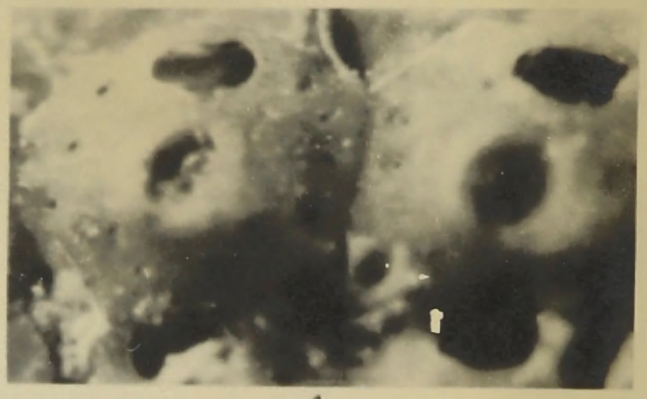

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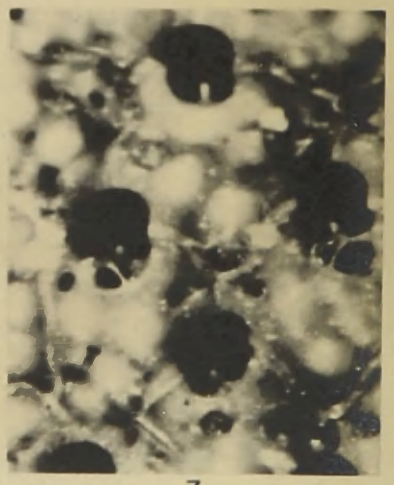

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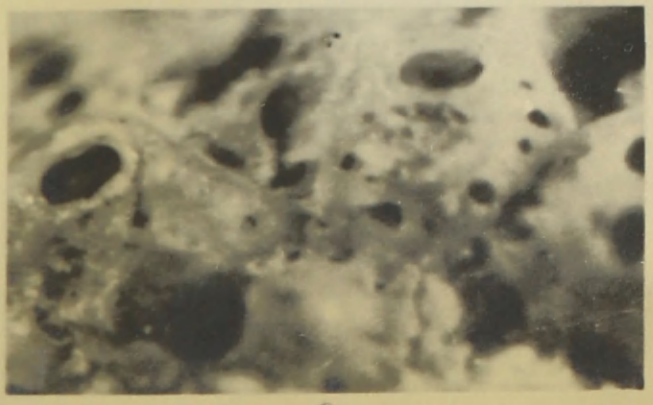

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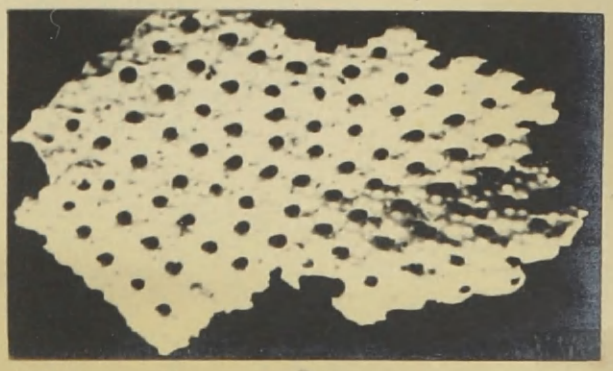

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PLATE XXVII

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	9. Surface of an old specimen, x 79. Locality 16.	
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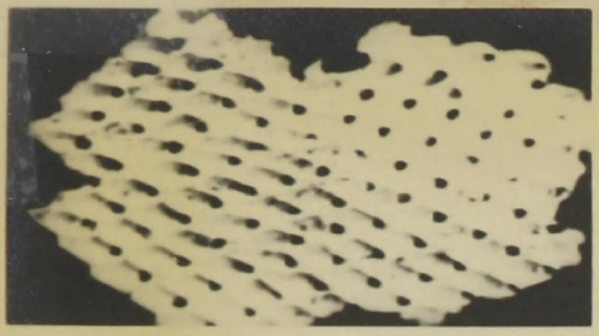

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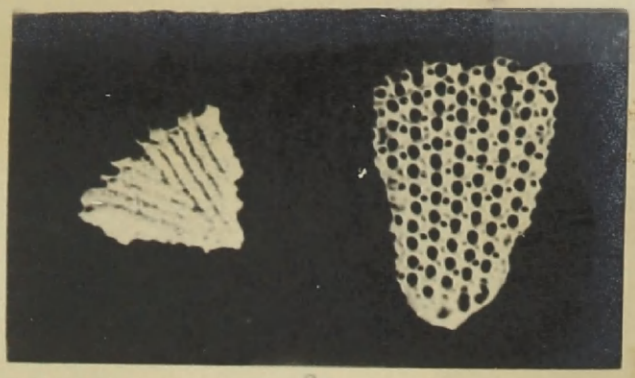

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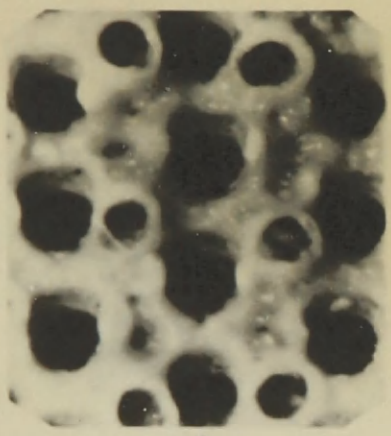

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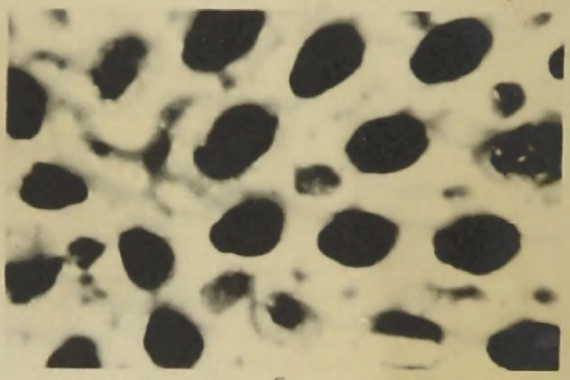

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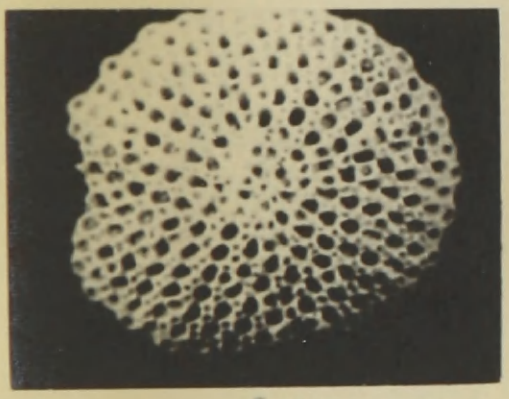

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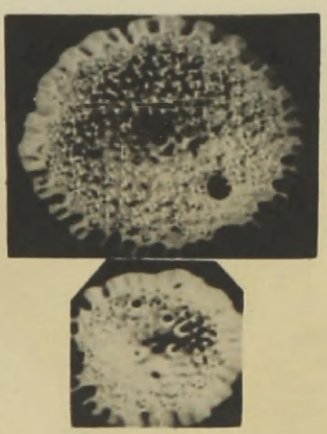

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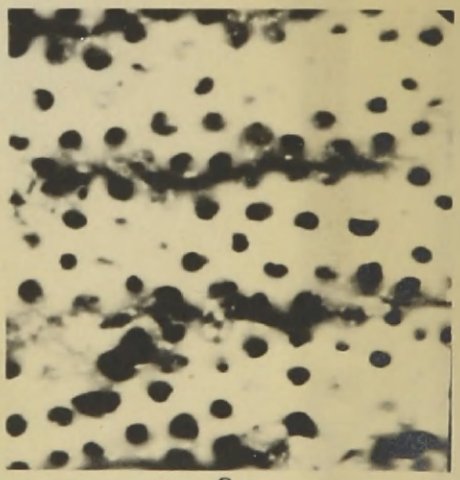

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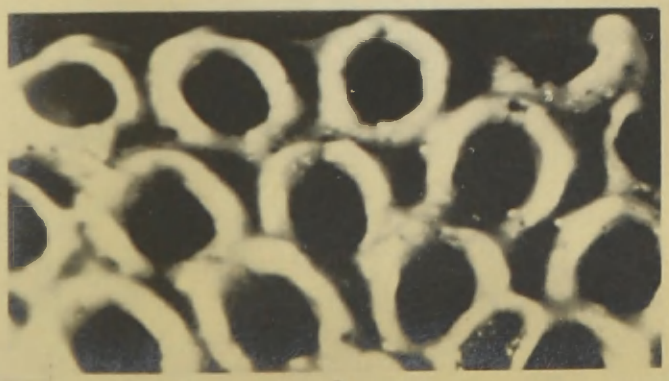

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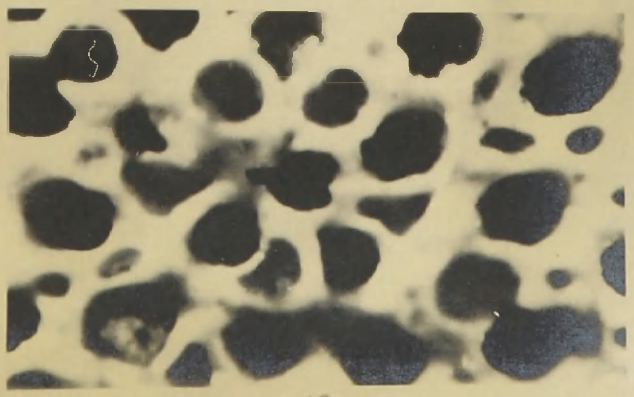

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PLATE XXVIII

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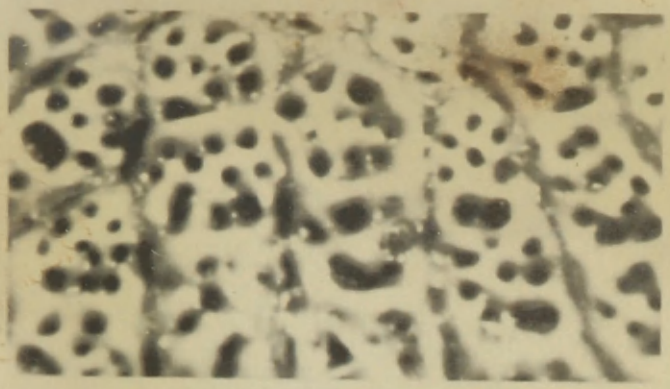

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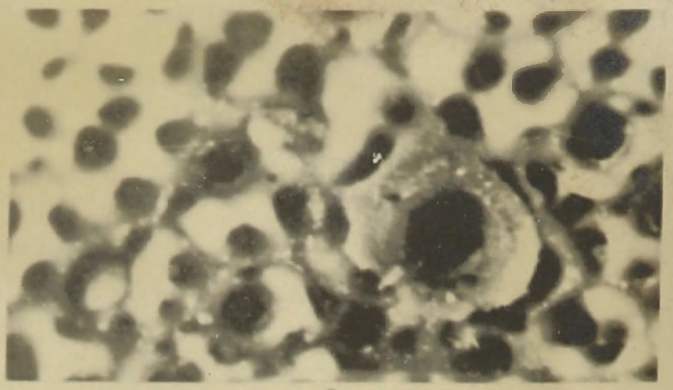

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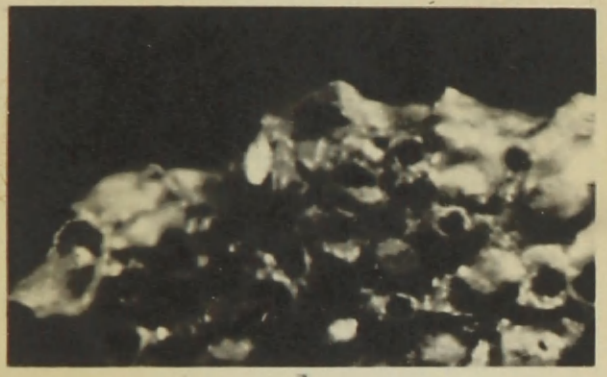

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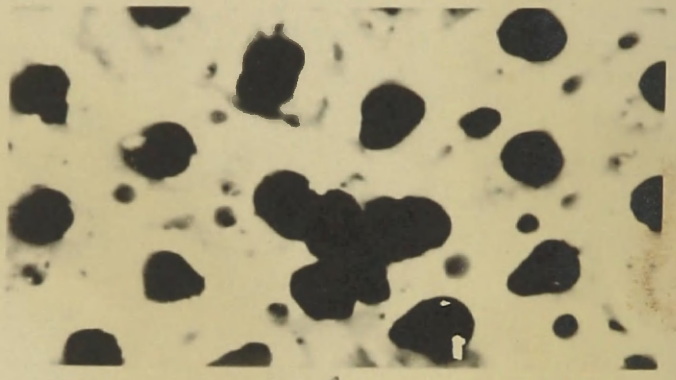

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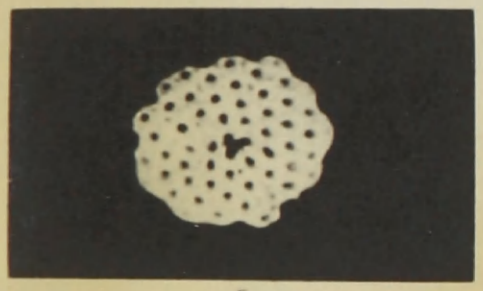

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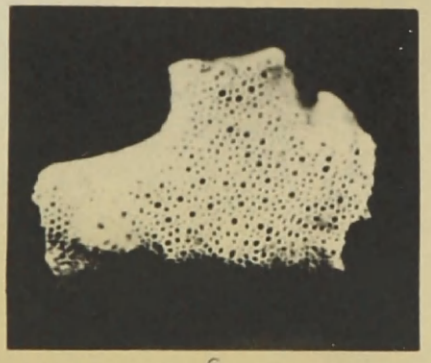

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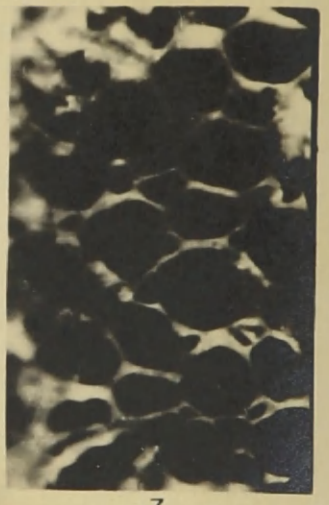

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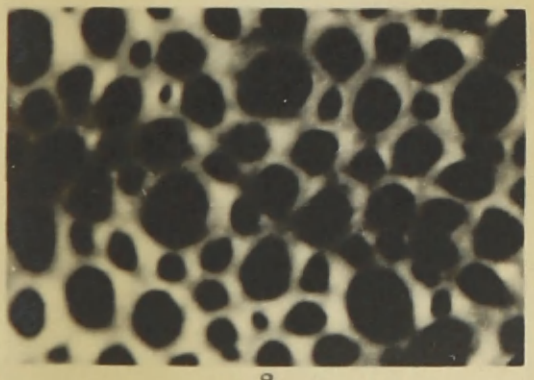

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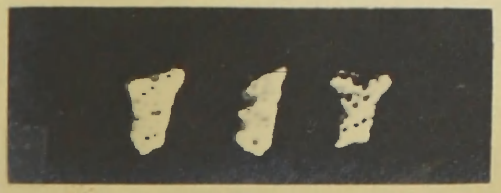

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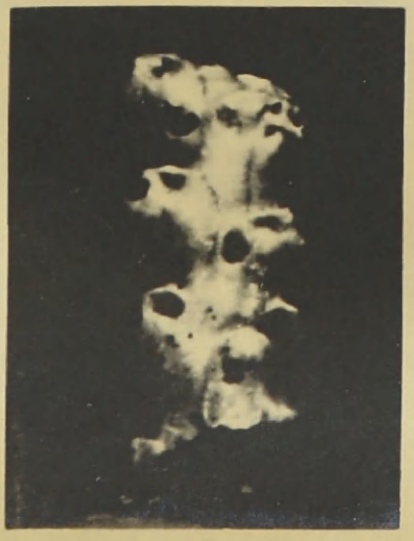

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PLATE XXIX

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6, 10. Two fragments of the cylindrical zoarium, x 13.3 and 8.8, respectively.

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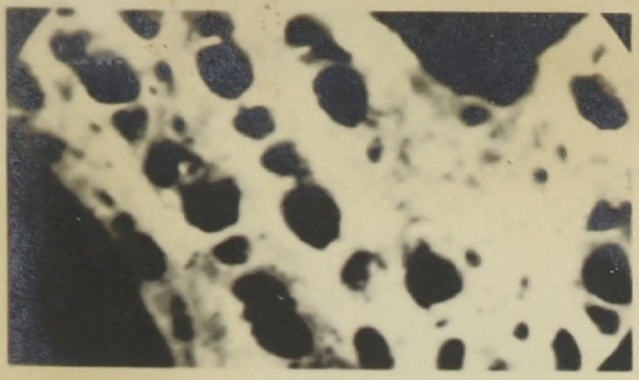
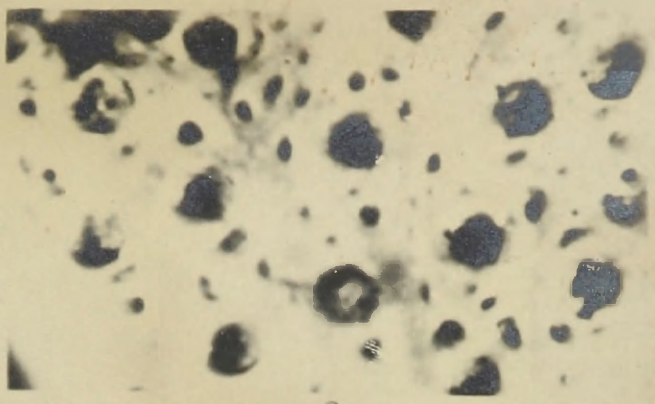
9. Dorsal view of a different specimen, x 13.3.





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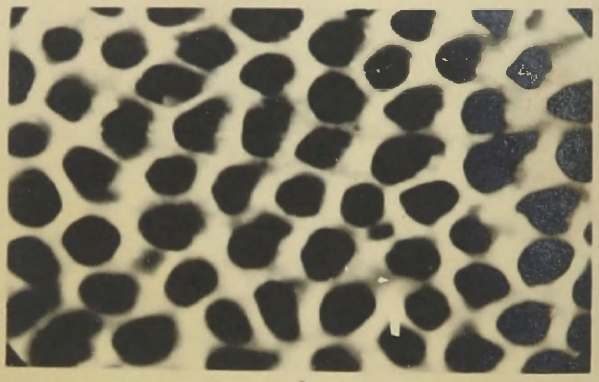

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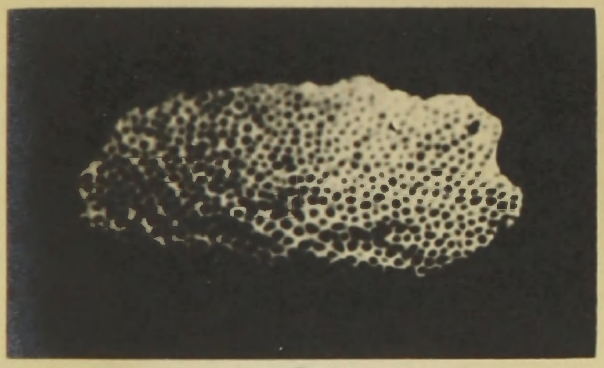

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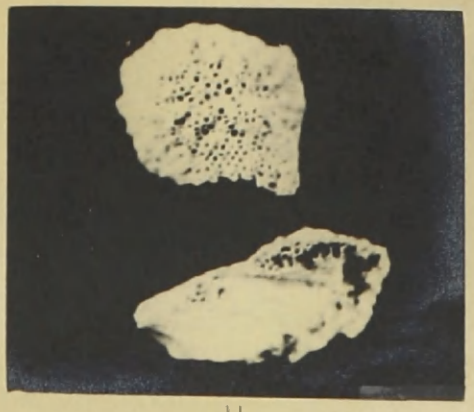

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PLATE XXX

Plate 31

Figures

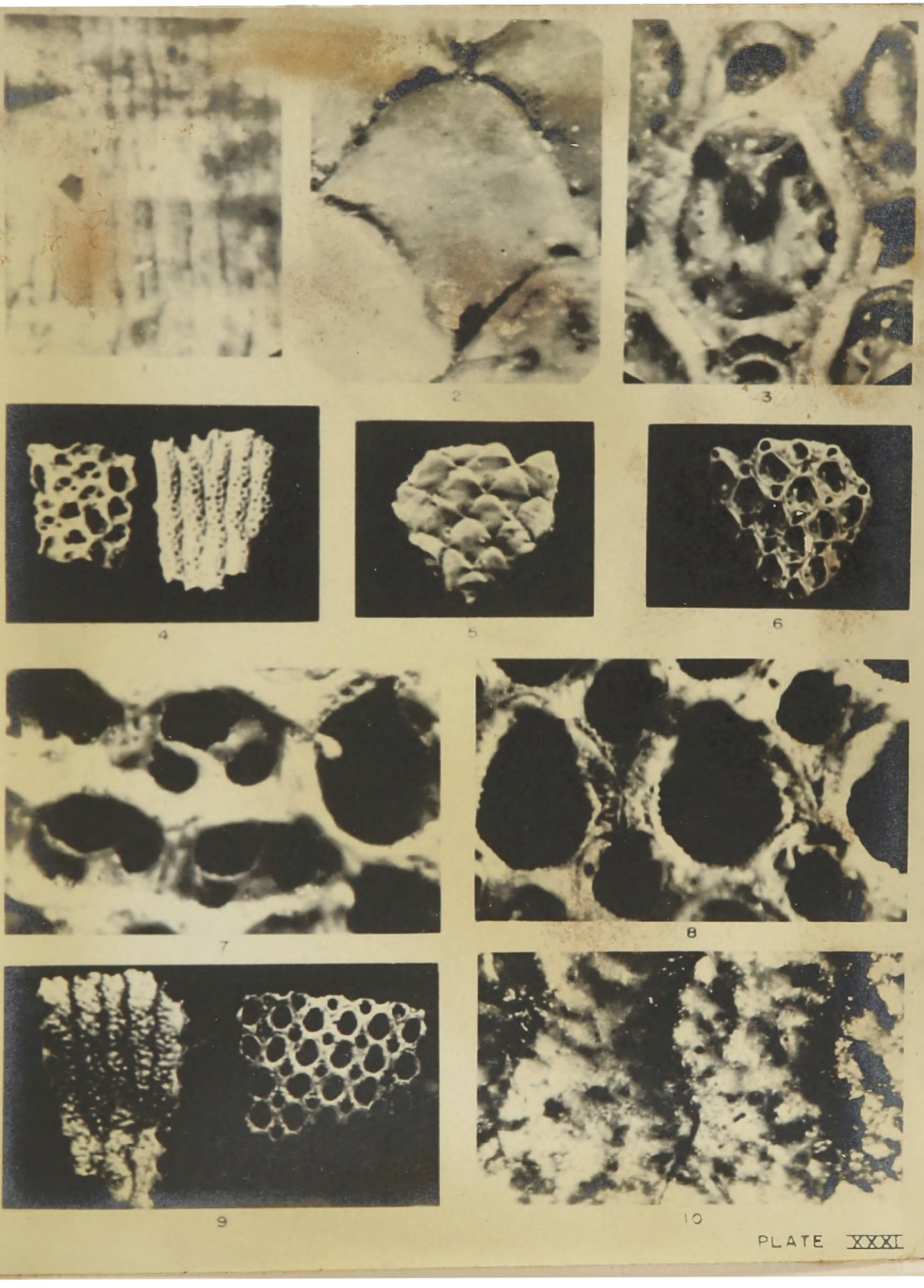

PLATE XXXI

EXAMINATION AND THESIS REPORT

Candidate:

Major Field:

Title of Thesis:

Approved:

Date: May 18, 1938

Henry V. Howe
Major Professor and Chairman

Charles W. Pipkin
Dean of the Graduate School

EXAMINING COMMITTEE:

E. L. Miller

Chalmer J. Ray

R. Hans Russell

Harold N. Fisk